The Veterinary Record.

(*Founded by William Hunting F.R.C.V.S., 1888.*)

No. 51. DECEMBER 19, 1925. Vol. 5.

Notes on a Trip to Denmark and Sweden. with Special Reference to Contagious Abortion and Sterility.*

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Ten minutes before I departed for Copenhagen, I was invited to read a paper on my trip to Denmark. This was at the beginning of September, and I consented to do so, fondly believing that I had undertaken an easy task. I was still under that impression when I returned here, as I had seen a lot and learned much during my twelve days there. Up to that time only one difficulty had presented itself, namely, just how to start and what to leave out; that difficulty is still with me, and Mr. Dawes has twice 'phoned to know if my paper is ready. How a general practitioner finds time to write a paper I cannot imagine, unless he burns a tremendous amount of midnight oil.

When we left Leith at 5 p.m. we were a party of nine, all proud descendants of the world's greatest seafaring nation; by 8 o'clock we were reduced to a party of six, and we were not so proud of ourselves; the following morning only four appeared for breakfast, and most of us came to the conclusion that our maritime instinct had expired with our great grandfathers. However, we all found our sea legs by the end of the first day, and thoroughly enjoyed the sing-song that night, and the games on deck the following day. I am sure the profession as a whole does not realise what Olympic talent lies dormant in its members, or what embryo Carusos fail to mature.

During the whole of our stay in Denmark and Sweden we received the utmost kindness from all, and everyone took great trouble to demonstrate and explain anything and everything in which we were interested. Professor Elleringer, the Principal and Dean of the Veterinary and Agricultural College, received us and made us welcome.

All our party were members of the Dick College, and we all, in our insular prejudice, imagined that our Alma mater was the finest and best-equipped College in existence. That was before we went to Copenhagen. This College, which is state owned, covers a vast area of ground, and several of the Departments are themselves bigger than the new Dick College.

It is to Professor Folmer Nielsen that we are most indebted for making our sojourn in Copenhagen the success it was, for it was he who planned everything and gave up to us all his spare time, introduced us to the various Professors and took us round farms, etc. We also owe to him a debt of gratitude for the very masterly address on Sterility which he gave us one Saturday night, and which lasted from 7-30 until 11 o'clock.

* Presented to the Midland Counties Division at Worcester, on November 19th, 1925.

Professor Nielsen is himself in charge of the Obstetric Department and small animals out-patient clinique, in which we saw him perform a cæsarian operation on a bitch by the flank, and also set a fractured tibia by wiring the bone. An extensive addition to the Obstetric Department is nearing completion.

Undoubtedly the finest part of the whole College is the new Pathology Department, which is under the direction of Professor Folger. It is really palatial. It cost £50,000 to build and over £25,000 to equip.

A whole book could be written about this Department, which lacks nothing; a number of dressing rooms and shower baths are provided; the *post-mortem* theatre is like a marble palace with glass walls and a glass roof.

The Pathological Museum, I should imagine, is the finest in existence, the specimens numbering many thousands; each specimen is perfectly mounted in a glass case containing preservative. There is a special staff employed in the basement of this department, who do nothing but preserve and mount the specimens. All specimens are so treated that they retain their natural colour.

Every specimen is numbered, catalogued, and grouped, firstly under general pathological diseases such as inflammations, neoplasms, etc., and secondly under regional pathology, such as diseases of the liver, lungs, etc., so that reference is greatly facilitated. For specimens which are too large to be mounted in glass cases there are huge preserving tanks in the basement.

Cooling and refrigerating chambers are also in the basement.

The Lecture Room is on a par with the rest of the Department. It is lighted by fourteen windows, and has a roll-up screen behind the Professor's desk for lantern work. At the back of the room is a huge lantern which is so constructed that it can be used for reflecting upon the screen large fresh or preserved specimens, pathological slides or smears.

If, in the middle of a lecture, it is desired to make use of the screen, the lecturer moves a switch under his desk and the screen and the blinds of the fourteen windows descend automatically.

The Department of Medicine, under Professor Bang (Junior) is very extensive and includes stables and loose boxes of its own, together with an exercising and colic box, which is nearly of the dimensions of a riding school.

The Department of Bacteriology and Milk, under Doctor Christiansen, is also extensive and wonderfully equipped.

The Department of Zootechny and Hygiene, under Professor Yespersen, is also particularly well equipped. This gentleman is particularly proud of his collection of riding and driving bits, and spurs, which is represen-

tative of all countries; he has also what is claimed to be the largest and finest collection of wool in the world. Professor Yespersen is the only member of the professional staff who does not speak English (most of the others speak it fluently), but to compensate for this disability he speaks French, German, and Spanish.

Professor Grunthe is in charge of the Farriery School. The Shoeing Forge contains twelve fires; in addition to the students having a practical course in farriery, shoeing smiths, after taking their course, are granted a diploma if they successfully pass an examination.

An innovation here which interested us greatly was a cork pad, which is used in Copenhagen instead of rubber and other non-skid pads, and this is claimed to be highly successful. The cork is boiled or steamed whilst the shoe is being made; it is then cut to size, and after the shoe has been applied, the pad, which is now soft, is fitted on so that it covers the whole sole, being retained in position by notches cut into the inner margin of the shoe whilst it is being made. Professor Grunthe has a collection of horse shoes, both army and civilian, representative of all ages and all nations; the shoes number about 1,400.

Professor Hansen is in charge of the small animals' clinique, also of the pharmacy, and he showed us a wonderful collection of plants poisonous to livestock.

The Professor of Surgery, Professor Morkeberg, was exceptionally kind and we spent many pleasant hours with him, and witnessed a number of his operations. Professor Morkeberg never wastes time using interrupted sutures; all muscle sutures are continuous wire sutures, and we understand this is general throughout Denmark; for skin sutures the Professor always uses pins.

A large addition to the surgery department is nearing completion.

Professor Morkeberg has what we all envy him, namely, a man who thoroughly understands restraint of animals, and he gave us several demonstrations in methods of casting and tying, which we greatly appreciated, for undoubtedly nothing is so irritating to an operator as to have an animal not under proper restraint. I think this man had a different method of restraint for every conceivable operation and position.

The College Library contains 42,000 volumes, and includes books on veterinary subjects, agriculture and forestry, in many languages, as well as the weekly and monthly scientific journals of most countries. The Library is open to the public and every week dozens of books are sent by post to all parts of the country.

The Professors nearly all live in charming houses within the College grounds.

We were indebted to Professor Morkeberg for taking us over the premises of the Copenhagen Milk Supply, of which concern he is the veterinary supervisor. This is one of the largest and most up-to-date dairies in Copenhagen and employs 800 men and women. The whole place is absolutely spotless, and water flows continuously down the white tiled walls and white enamelled brick floors. Every employee is clad in white overalls, cap, and wooden clogs. There is a laundry attached to the Dairy.

This Dairy deals with 24,000 gallons of milk a day, of which 10,000 gallons are bottled.

No less than nine different grades of bottled milk leave this factory. 3.6 per cent. of this is 'Children's milk,' which is from 500 tubercle-free cows, the bacterial content of this milk must not exceed 10,000 bacilli per c.c. and the milk must be brine cooled on the farm. This milk, after being bottled, is capped with a metal cap.

Other grades are—best quality cream, second quality cream, Jersey milk, sweet milk, pasteurised whole milk, pasteurised half-skimmed milk, pasteurised skimmed milk, and raw buttermilk.

Thirty per cent. to 40 per cent. of the milk is pasteurised.

Trained bacteriologists examine samples of every farmer's milk as it comes into the Dairy.

All the bottle-washing and bottle-filling plants are of the latest type, the latter are able to deal with 3,500 bottles an hour.

One day we were taken by Professor Nielsen over the home farm of Th. Madsen-Mygdal, Esq., the former Minister of Agriculture for Denmark. He has a tubercle-free herd of nearly 300 cows, and he bottles all his own milk, which is 'Children's milk.' After having a free herd for many years this gentleman bought some Jersey cows which were from a supposedly free herd; when next his cows were tested a whole lot of them reacted, including a number of the Jerseys, and it took him three years to get free again.

We also visited another large farm belonging to a very up-to-date farmer. In 1921 this farmer had his herd of 183 animals tested for tuberculosis; 91 passed and 92 failed. The reactors were put on a separate farm. In 1922, 108 animals were tested; 10 reacted, all of which were old cows. In 1923, there were 3 reactors, in 1924 there were no reactors. This year there were 3 reactors, possibly due to the fact that foot-and-mouth disease broke out between the last two tests, weakening the animals' constitutions, and enabling traces of tuberculosis to develop.

Professor Nielsen says that he has frequently noticed that the incidence of foot-and-mouth disease coincides with the rise in the number of reactors on a farm.

This farmer has had foot-and-mouth disease every three years for the last twelve years. During these outbreaks many calves die, all milk goes and in some cases does not return, and many cows abort; the whole herd is infected in four days.

This farmer has had abortion for ten years, the number of abortors fluctuating each year. He had thirty cases the year before last, these were all vaccinated and six of them aborted again last year.

The cows are all tethered out-of-doors from 1st June to 1st October. They are milked three times a day, at 4 a.m., 10 a.m., and 5 p.m.; moved six times a

day, before and after each milking, and watered five times a day.

The three milkers who have charge of these cows are paid according to milk yield.

Two carts, each with two churns and a bucket of water, soap and towel are taken to the field, the men's hands are washed between the milking of each cow and the carts take the milk back to the Dairy, where it is brine-cooled.

The keynotes of Danish success are organisation and co-operation, which manifested themselves everywhere we went. They were particularly well demonstrated at the Gifion Factory at Frederikssund, which is a Farmers' Co-operative concern, and here vast numbers of eggs and pigs are dealt with.

Lorries collect the eggs daily, and each egg bears the number of the member and the date of laying. The eggs are first graded. A number of perforated trays are placed on a table, and each tray has a different sized hole, into which the eggs are placed. The trays each hold 120 eggs and are numbered 14, 15, 16, 17 and 18, which means that 120 eggs placed in number 14 tray weigh 14lbs., 120 eggs in number 15 tray weigh 15lbs. and so on for the five trays.

The women employed on this work develop such a keen touch that they know immediately they handle an egg which perforation it will fit whereas, to an on-looker, though it is fairly easy to observe the difference between a number 14 and a number 18, the intermediate grades are very deceptive.

When graded, each tray is placed in a dark chamber, and the light from powerful electric lamps is reflected below the tray so that every egg becomes transparent, and a glance is sufficient to reveal a bad egg; in fact, so clear and uniform are the fresh eggs that one's gaze is immediately drawn to the bad egg, which appears black. The bad eggs are, of course, withdrawn, and the number and date being recorded, they are debited to the members' account.

The fresh eggs are then either packed in boxes, each box containing 1,440 eggs, and these exported, chiefly to the United Kingdom; or they are preserved in huge concrete tanks containing lime water. These latter eggs are already sold before they are preserved, the buyer taking the risk of the variation in the market price, while the factory takes the risk of the rate of exchange. When the eggs are removed from the preserving tanks they are washed and again subjected to examination by electric light.

The pigs are sent to the same factory by the members. After fasting, the pigs are driven half a dozen at a time into a sty where a hefty Dane secures each one in turn by the right hind leg, slings a chain round the leg and hooks it on to a rung of a moving ladder, which hoists the pig from the ground and carries it over a huge blood tank; as it reaches the edge of the tank it is "stuck" and bleeds as it travels along towards the scalding tank, where it is received by another man who pulls a chain and the pig is lowered into the tank and the chain removed. From three to six pigs are in this tank at one time, and when scalding is complete the pig is guided to the other end of the tank where it is lifted by a pair of steel arms, which revolve slowly, and is placed on a moving tray and carried to a revolving drum, grooved like the barrel of a gun, the ridges being composed of wire bristles which partially scrape the pig as it is propelled forwards by the revolving of the drum on to a bench, where two men complete the scraping. Here a steel spreader is inserted, a chain is pulled, the pig is hoisted on to a runner and carried forward into a furnace which resembles a huge drain pipe composed of two halves, each heated by burning oil, and which encircle the pig for about twenty seconds. The furnace then divides again, and the pig continues its journey. It is scraped again by one man; washed with a hose; disembowelled (the mesenteric glands and the viscera being examined); its lungs and heart are removed and examined. The carcase is split and examined; re-washed; stamped and weighed; and the member is paid by this weight. The spine is removed and sold for soup. The sides are placed in a cooling room for twelve hours. During all this time the pig has been travelling. Each operation is done by a separate man, who never leaves his place.

The pigs follow one after another. It occupies from twenty to thirty minutes to treat one pig from the time it enters the sty till it enters the cooling room. An average of fifty pigs an hour are dealt with, or 2,000 a week of four days.

If the bacon is for export, the sides, when cooled, are dressed; brine solution is injected into the flesh by means of a hose armed with a large-sized hypodermic needle; the sides are then covered with salt and lowered into tanks, where they remain for forty-five days.

Even pigs which arrive dead at the factory are not wasted. They are taken to a separate building, where they are placed whole into a "digestor"; after "digestion," part is used as manure and part is incorporated with other material and fed back to pigs.

NOTES ON TUBERCULOSIS AND MILK.—Professor Bang (Junior) states that his father's method for the elimination of tuberculosis is still used. Vaccination is not practised. The Sanocrysen method is impracticable for lower animals; three out of the five animals tested died from anaphylactic shock. Neither is the Calmette-Guerin method used.

All the medical profession recommend raw milk. Pasteurised milk must be declared and the rapid method is used, the slow method being forbidden. Less than 10 per cent. of the milk used for human consumption is pasteurised.

Professor Bang says that the subcutaneous or intradermal method is used alone, or they are used together, according to the desire of the owner.

Professor Bang believes that there are numerous cases of tuberculosis, due to the avian type of bacillus, which do not react to the subcutaneous test with bovine tuberculin, but they react to the intra-dermal test. Dr. Plumer, of the Serum Institute, Copenhagen, states that this is because the intradermal test is finer, though not so specific.

Doctor H. Magnusson, Director of the Serum Institute, Malmo, Sweden, states that in 1909, 90 per cent. of the cows in the province of Malmöhus reacted. The tuberculin test was used on the young animals which were kept isolated, and now there are 150 free herds, and 200 herds in which cases of open tuberculosis are removed.

Both subcutaneous and intradermal tests are employed; the latter is better, but the former has been more frequently employed up to the present.

All the milk returned to the farmers for feeding purposes must, by law, be pasteurised. Offenders are punished by fines. In Sweden when milk is pasteurised the slow method is adopted.

The farmer is paid on the butter fat content of the milk when it arrives at the dairy.

NOTES ON ABORTION.—Professor Bang (Senior) states that 2 per cent. of abortion is due to the tubercle bacillus, and 2 per cent. of this is of the avian type; the latter only appears to be found in the uterus—this may be due to the large blood supply to the pregnant uterus. He does not consider that vaccination has been successful.

Professor Bang (Junior) uses strains up to one year old for his vaccine, and makes no test for virulence. He has isolated the organism from the milk of an animal six months after it had been vaccinated. He thinks that the risk of a virgin heifer as a carrier is negligible. He has no statistics to prove that vaccination causes sterility, but does not deny the possibility of it.

Results of vaccination are very inconclusive.

Doctor Magnusson, Director of the Serum Institute, Malmo, Sweden, states that vaccination has only been adopted during the last two years, but the results so far are not encouraging.

He proposes trying the intravenous injection of the dead vaccine.

Great work is being done on abortion at the Serum Institute, Copenhagen, by Professor Thompsen and Doctor Plumer. Contagious abortion is a notifiable disease in Denmark (I would that we could say the same), failure to report being punishable by a fine of from £5 to £25. When an animal aborts in an hitherto free herd, the veterinary surgeon immediately takes a piece of the placenta and a sample of the blood, which are sent to the Serum Laboratory in special containers for examination. A smear from the placenta is examined microscopically, and if positive the blood is not examined. If the placenta gives a negative result, both the agglutination test, and the complement fixation test are applied; if one of these is negative then the case is considered to be doubtful, and a further sample of blood is taken three weeks later and examined.

In 70 per cent. of positive cases the bacillus is found in the placenta. It is impossible to tell from naked eye examination whether the abortion is due to the tubercle bacillus or to the abortion bacillus. When the result is positive the herd is placed under police control, and no animal is allowed to be sold to an uninfected herd.

If the infected animal is isolated at once, and kept isolated for eight weeks, there may be no further case of abortion. The method recommended is as follows: after the aborted animal has been isolated, or otherwise disposed of, the blood of all pregnant animals in the byre is subjected to the agglutination test, and reactors are isolated; this test is repeated in six weeks, and again after a further period of six weeks. In this way infected animals are isolated before they become infective to other animals.

This method has proved highly successful.

Vaccination is also carried out, but results are very doubtful. In badly infected herds, when no vaccination is done, 35 per cent. to 40 per cent. of the animals abort. After vaccination 20 per cent. to 25 per cent. of the animals abort, but it must also be remembered that abortion will decrease by itself if untreated, providing no fresh animals are introduced.

The intravenous injection is to be tried.

The *Bacillus abortus* cannot live more than six weeks in the uterus, but it can exist for a year in the milk.

Cultures are made on slow agar for three to four days; 15 c.c. of normal saline solution is then added. Experiments have been carried out with goats in which vaccine has been injected into the uterus. In some cases it appeared to afford protection, but rendered others sterile. There was no endometritis, either in pregnant or non-pregnant cases.

NOTES ON STERILITY.—Few subjects to-day are of greater importance to veterinarians than the subject of sterility. More and more are our clients realising the losses which they sustain through this or that cow not "holding to the bull" at all, or only proving pregnant after repeated services, so that when at last the cow does calve it is probably in May or June, instead of in the lucrative Winter months.

Frequently the bull is blamed, and often a valuable bull is sold because he cannot "stop" the cows, possibly he is to blame, but more often he is not.

A few weeks ago I visited a farm to examine a cow to see if she was pregnant or barren, and I listened to a pitiful tale of woe. The young farmer had three years ago been a very successful member of the Staffordshire Recording Society, but during the last year or two he had experienced great difficulty in getting his cows in calf. He had been unable to "catch them bulling," and to remedy this he had turned his bull out to run with the cows. Then a fresh complication arose; some of his heifers began to abort. He was unable to understand the position until he found his bull serving cows which he believed to be six or seven months in calf and frequently very near to calving. The bull was condemned as an unnatural animal, and he was sold. Still the animals aborted, and others remained barren. This man has now winter to face with his best cows nearly dry and barren, and no prospect of any more calving till the spring.

This is a history familiar to us all, and we are frequently never consulted till great harm has been done.

It is not as an expounder of new doctrines that I pen these notes, but entirely as a seeker for knowledge, and I do trust that we may all profit from a discussion on this important subject.

Admittedly the ovary plays a very important part in the life of the female animal, not only on account of its egg producing properties, but because of the physical and psychical influence which it exerts upon the animal.

Briefly, the chief factors responsible are :—

1. The graffian follicle.
2. The corpus luteum.
3. Interstitial gland cells.

Ovulation usually takes place during the last part of œstrum.

Maturation varies, but the process is a definite physiological phenomenon.

There is a hyperplasia of interstitial tissue, whether conception follows or not.

The corpus luteum in a cow begins to disappear in a week and is gone before the next heat ; if the animal is pregnant it remains throughout the period of gestation.

If the corpus luteum persists, it prevents ovulation. The corpus luteum plays an important part in the nutrition of the fœtus until half-way through pregnancy. Ovulation may occur without œstrum and œstrum may occur without ovulation. This may be proved by three factors.

1. The dimensions of the ovary.
2. The contents of the corpora lutea.
3. The dates of the heat shown.

Heatless ovulation is quite common during the first two or three months after calving. This, Nielsen believes, is often due to a chronic endometritis.

Systematisation of Causes of Sterility. — (A). OVARIES.—These are rarely the primary cause of sterility. The persistence of the corpus luteum due to chronic endometritis is not common ; treatment—squeeze out corpus luteum, and heat will shew in two days.

1. Functionless ovaries.
2. Congenital hormonal deficiency in adipose and lethargic animals, due to sluggish metabolism.
   TREATMENT.—Tonics and aphrodisiacs, presence of male. If successful, recovery will be due to increased metabolism, and not to increased sex action.
3. Acquired hormonal defects such as excess of work, debility, etc.
4. Pathological changes of ovaries—
   (*a*) tumours of ovary ; these are rare.
   (*b*) disease of ovary ; may be tubercular, or due to perimetritis.
   (*c*) inflammation of ovary. This is overestimated as a cause of sterility. It is uncommon, but may be due to the act of crushing the corpus luteum ; is usually due to a severe endometritis.
   (*d*) cystic degeneration of ovary. This is a secondary infection resulting from inflammation of the uterus, and due to a chemical toxæmia. The reasons for this belief are (1) proof of chronic endometritis ; (2) if common in a herd one finds many cases of abortion, or retention of the placenta ; (3) it appears in animals known to have suffered from chronic endometritis long before cystic degeneration is discovered.
   It is not hereditary.

(B). FALLOPIAN TUBES.—Tuberculosis of salpinx is not common. Salpingitis is due in nearly every case to metritis. The prognosis is doubtful, and one can only treat the uterus.

(C). UTERUS.—Undoubtedly, chronic endometritis is the chief cause of sterility, and the bacillus abortus by weakening the mucous membrane predisposes the uterus to infection.
Endometritis may conveniently be divided into four divisions—

(1) *Endometritis of the First degree* (chronic catarrhal endometritis), that is, a light inflammation of the uterus, in which one gets an opalescent mucous discharge with flocculi. To diagnose, massage the cervix to get discharge.

(2) *Endometritis of the Second degree* (mucopurulent or purulent metritis.) Manipulation per rectum reveals an enlarged uterus, and per vagina the os is larger than normal. There is an abundant mucous discharge, with small flocculi, or pus alone.

(3) *Endometritis of the Third degree* (pyometria). Examination per rectum reveals an enlarged uterus ; the horns are thickened and may be 10 to 15 cms. wide, and it may be impossible to feel the large front curvature. On examination per vagina one may find a dilated os, and there may be a daily discharge of a purulent nature, or the os may be closed and the discharge may be intermittent. Contagious abortion and retention of placenta are the chief causes of pyometria.

(4) *Endometritis of the Fourth degree* (cystic degeneration of ovaries). With nearly all cases of cystic degeneration of the ovaries one gets nymphomania. Per rectum one finds that the uterus is not enlarged, but it has lost its tone and irritability. The uterine horns are soft and straight and they do not contract on palpation, cysts are present on the ovaries.

Examination per vagina may show a discharge simulating that of endo-

metritis of the first, second, or third degree.

This degree is usually the result of contagious abortion.

SUMMARY.—Chronic endometritis of the first degree is responsible for 66 per cent., of the second degree 20 per cent., of the third degree 6.6 per cent., of the fourth degree 7.3 per cent.

Cows suffering from chronic endometritis of the first degree show regular heat and ovulation. Those suffering from chronic endometritis of the second or third degree show heat at long, irregular intervals, or no heat at all—probably an intoxication resembling heat. In chronic endometritis of the fourth degree there is an unhealthy abnormal irregular heat.

Conception is impossible in chronic endometritis of the third or fourth degree.

Preclusion of conception is not purely mechanical in chronic endometritis of the first and second degrees; it is probably due to the decomposition of protein products which destroy the spermatozoa.

Larger cows are more susceptible to chronic endometritis, owing to the longer period of the involution of the uterus.

DIFFERENTIAL DIAGNOSIS.—Rectal examination of the uterus, ovaries and broad ligament, examination of vaginal secretion, and the vulva and vagina.

TREATMENT.—*Prophylactic measures.*—Improved hygiene is essential, byres should admit of easy cleaning. Cows should be pastured as long as possible. During parturition and for three weeks afterwards cows should be kept in a clean, dry place; they should have straw and not chaff beds.

The after-birth should be removed as soon as possible; this is a vexed question, but it is a question of great importance. Admittedly, one cannot lay down any hard and fast rule as to the number of hours or days which should be allowed to elapse; many factors have to be taken into consideration.

If the cow is a large animal, the uterus will be longer contracting, and consequently frequently the after-birth is retained; if the cow is of a sluggish, lethargic disposition the uterus will lack tone, and be slow to contract, this also holds good in the case of a debilitated animal. If the animal calves a few days before her time is up, the villi of the fœtal placenta are more firmly embedded into the maternal cotyledons, and the cotyledons themselves do not appear to contract so readily. If it is a first calf there is a risk of the os closing early, this also frequently applies in the case of an animal which aborts; in this latter case one should always make a point of removing the after-birth at the earliest possible moment. If the calf is to be left on the cow it will usually be found that one does not require to interfere beyond severing any long pieces of placenta, which may be hanging, as the natural sucking of the calf stimulates the uterus and especially the cotyledons to contract uniformly. One can demonstrate this by manipulating the uterus per rectum whilst the calf is sucking, and also by having one's arm inside the uterus. One also notices that when the same manipulation is carried out whilst the cow is being milked by hand, especially if roughly milked, the uterus is thrown into violent and irregular contractions.

Treatment must be systematic. The herd should be examined monthly and pregnant cows noted. The method now being adopted in Denmark is for cows to be examined per rectum eight to twelve weeks after they have been served. The uterus, uterine horns, and ovaries are palpated, and a record is taken of cows which are pregnant and in which horn the embryo lies. This can be ascertained with certainty in nearly every case after a little practice; doubtful pregnancies are confirmed later. This method often saves months of time and pounds in money.

Cows should be examined one month after calving:

(1) Squeeze out corpus luteum in those cases where no œstral period has been noted, but where the animal appears healthy, and the uterus, etc. are normal. Prognosis is better in early stages.

(2) Cows which have shown œstrum two or three times after service should be examined. Previously treatment consisted chiefly of (*a*) ovarial treatment; (*b*) Albrechtsen's treatment of the uterus direct by douching with normal saline solution. Douching is difficult owing to the os being contracted; it is therefore replaced by the injection of fluid which is left *in utero*. Nielsen recommends the following:—

Chronic endometritis of the First degree 75 to 100 c.c. Lugol's solution into each horn of the uterus.

Chronic endometritis of the Second degree—in the same manner, or 25 c.c. tincture of iodine into each horn.

Chronic endometritis of the Third degree—50 to 100 c.c. tincture of iodine into each horn.

Chronic endometritis of the Fourth degree—25 c.c. tincture of iodine into each horn.

Nielsen reports that of all the cases treated by him by this method, 73 per cent. have become pregnant within six months; those which have become pregnant after that time have not been included, and for statistical purposes are considered as barren.

If the squeezing out of the corpus luteum is considered, then another 10 per cent. must be added, making 83 per cent. Of the 73 per cent. which were cured by injections alone:—

92 % were of the first degree of chronic endometritis.
54 % were of the second degree ,, ,,
35 % were of the third degree ,, ,,
17 % were of the fourth degree ,, ,,

(D). CERVIX.

(1) Congenital deformity of Mullerian ducts.

(2) Real tumours.

(3) Cervicitis—frequently an extension from endometritis, and associated with abortion and retention of the after-birth.

Treat with Lugol's solution as for endometritis.

(E). Vagina, Vestibule and Vulva.

(1) Congenital deformities.
(2) Cysts of Bartholin glands.
(3) Acquired deformities due to lesions of mucous membrane during calving, and stricture of vagina.
(4) Laxity of vagina whereby urine, etc. is held; this may run into the uterus.
(5) Nodular vaginitis—hot swellings covered with mucopurulent material causing the hairs round the vulva to stick together. This is the most common cause of sterility in heifers, but is of no importance in old cows. No treatment is satisfactory. ½% formalin douches two or three weeks before service, and irrigation with normal saline solution just before service are probably the best methods of treatment.

Notes on Foot-and-Mouth Disease.

Doctor H. Magnusson, Director of the Serum Institute at Malmo, states that Sweden adopted a slaughter policy from 1886 until this January, when, owing to the severity of the last epidemic, in which 50 per cent. of the animals were affected, the slaughter policy was temporarily suspended and vaccination has been carried out instead. As soon as this present epidemic, which came from Denmark, has exhausted itself, the policy of slaughter will be re-introduced.

Only calves and pigs are vaccinated, and the disease then appears only in a very mild form and the mortality has been greatly reduced by this means. The dose for calves is 200 to 300 c.c. and 20 to 100 c.c. for pigs. For the preparation of the vaccine 7 to 8 litres of blood are withdrawn from each cow three weeks after recovery. The blood is preserved with chinosol.

A peculiar feature of the disease which has been frequently noted is that calves drop dead without showing any symptoms after they have been fed on milk from infected cows. In every case necrotic areas were found in the heart; sometimes these areas were fairly extensive, but often they were present only as thin necrotic lines. We were shewn a number of lantern slides of these areas of necrosis, also of the sloughing of the claws and bones of the foot. Many of the abscesses in the feet are found to contain the *Bacillus pyogenes.*

Some cows have shewn no symptoms other than very rapid and distressed breathing; upon being slaughtered, no lesions at all have been found; the respiratory distress is thought to be due to infection from internal secretory glands.

As soon as foot-and-mouth disease is reported, military guards are posted on the infected farm. Lime and lysol are used as disinfectants.

If foot-and-mouth has not been reported, it may be detected up to eight weeks afterwards by the examination of histological sections; pigmentation and vesicles are still apparent.

Loeffler's immunising serum is used in some cases and gives protection for ten days.

Doctor Magnusson has also done a lot of research work in connection with actinomyces. He finds that true actinomycosis (*Actinomyces Israeli*) only occurs in the jaw; it is then a true ray fungus. He states that actinobaccillosis is confined to the tongue and lymph glands and is distinct from the foregoing. Also, that the stomach lesions, formally attributed to actinomyces, are in reality due to *Bacillus pyogenes.*

One of our red-letter days was our trip to Malmo, in Sweden, where we visited the Serum Institute, the slaughter-house and the Agricultural College.

We were received by Doctor H. Magnusson, who speaks fluent English and who was kindness itself. Doctor Magnusson conducted us over the Institute, explaining everything; he gave us a brief lantern lecture on foot-and-mouth disease, and showed us how the serum was prepared.

We were later joined by Mr. Miles De Wachenfelt, the agricultural adviser to the Royal Swedish Legation in London, and together we attended a sale of pedigree Friesian bulls, which was very interesting. Four judges were employed and each had a printed form with the most important points tabulated for marks; the judges marked independently and then conferred after the examination of each bull was completed. Half the possible number of marks were given for pedigree and milk records. This, I believe, is a custom adopted throughout both Sweden and Denmark in judging stock.

We afterwards proceeded to the public slaughter-house, which is very similar to that of any other in Sweden and Denmark; the whole building is light and airy, and every possible device is employed to ensure facility for cleansing; all floors and walls are either white enamelled bricks, or else white tiles, and over these cold water flows continuously.

There is here an excellent cold storage accommodation for butchers, which consists of huge lock-up cages of iron bars, between which all meat is clearly visible. For these the butchers pay a small annual rental which must compensate them many times over for the meat which would otherwise perish from lack of cold storage.

There is also employed in this factory the most humane apparatus that I have yet seen for the slaughtering of pigs. I believe it was described by Professor Linton, in his very able article on that subject, but at Malmo, after the pig has walked quietly up the narrow gangway, he is pole-axed instead of shot. The pole-axe, however, is in this case quite humane; one man follows the pig up the gangway and, standing behind the pig, holds the pole-axe against the animal's skull; a second man standing in front gives the pole-axe a hefty blow with a heavy mallet from a full-arm swing, which drives the pole-axe about three inches into the skull. The side of the gangway is then dropped and the pig slides out and is "stuck."

In the afternoon, we went into the country to visit the Agricultural College, a mansion charmingly situated in most beautiful surroundings. Here, in addition to Agriculture, are taught Forestry, Dairying,

and Farriery. The actual course for agricultural students is two years, and the cost £70 a year, including board and lodging; there are no extras. Each student has his own bed sitting-room.

In addition to the regular course of study, there are short courses for farmers and farm pupils, and, quite separate and distinct, a course for farm bailiffs and cowmen; these cowmen are all intelligent men who do not feed two scoops of this and one of that by rule of thumb, but who understand nitrogenous ratios and such like.

The school of Dairying is excellently equipped, and is under Professor Rosengren, who is, I believe, one of the world's leading authorities on cheese. Here we saw thousands of cheeses of every variety and size from half cwt. to quarter lb.

As a special favour we were taken into Professor Rosengren's private laboratory, where, under double lock and key, we were shown his latest treasure—a small cheese under a bell jar, with an absolutely pure culture growing on it; only the Professor and one of his assistants had the key to this cheese, which was tended every few hours.

Two veterinary surgeons are attached to this College, which has its own farms for experimental breeding and research. Shropshire sheep are the latest import from England.

In Sweden it is absolutely forbidden by law for anyone unconnected with it to enter a cowshed at the present time, owing to the prevalence of foot-and-mouth disease; and even in normal times it is considered in the light of an offence.

In Sweden there are annual grants for veterinary students, to enable them to go abroad for three months' study in any foreign country. There is one grant of £90, two of £65, and three of £25. Two-thirds of the grant is paid before leaving, and the remaining third, after they have returned home and written a report. Any student desirous of studying abroad may apply for a grant. This is a custom which might well be adopted in this country by the various Veterinary Colleges; or indeed by divisions of the N.V.M.A., such as the Midland.

The last, but not the least interesting, feature of our stay in Copenhagen was the demonstration of Danish veterinary instruments, given by Professor Thompsen, and assisted by Professor Morkeberg and Professor Folmer Nielsen; this was followed by a dinner, given by the Danish instrument makers, Simonsen and Weels, at the Royal Yacht Club.

Four of us stayed the night at Randers, where M. Mose, Professor Nielsen's brother-in-law, has a large practice; he is one of the foremost veterinary surgeons in Denmark. M. Mose was hospitality itself; he took us round several of the country dairies, all of which are run by the farmers themselves as co-operative concerns. Attached to each dairy is a Controller, who visits every farm in his area every three weeks: he weighs and takes the butter fat percentage of each cow's milk. It is on this fat content that the farmer is paid. The Controller is qualified to give expert advice upon feeding, etc. He also showed us a heifer, on which, nine weeks previously he had done a Cæsarian operation; only a slight scar remained. We also saw an officer's charger, on which he had performed the Swedish crib-biting operation. M. Mose told us that he frequently does both these operations.

We were very interested in his method for casting horses in his own yard. He has a narrow building like a small garage, in which is a raised concrete bed about 8 feet square; lying over this is a wooden platform. On this platform are placed two or three sacks filled with straw. The horse is placed parallel to the concrete bed, the hobbles are placed in position with the rope just taut; the free end of the rope is then fastened to an iron ring, which is embedded in concrete outside the building. A rope is put round the forearm and over the shoulder which is further away from the bed; another rope is placed round the horse's flanks. Two men take hold of these two ropes and a third man holds the halter. All three men are standing on the side of the concrete bed away from the horse. At a given signal the three men pull the horse on to the bed and he falls on the sacks; one of the men then sits on the horse's head. In falling, the horse tightens the rope through the hobbles. M. Mose states that he invariably uses this method on his own premises and that three men are sufficient to cast the biggest and strongest horse.

Discussion.

Mr. J. R. Barker: It is indeed a pleasure to me to respond to the invitation to open the discussion on Mr. Steele-Bodger's excellent survey of his trip to Denmark and Sweden.

Very early on the writer of the paper refers to his difficulties; we are all quite pleased that he was able to overcome most of them. The paper is necessarily extensive and some of what is contained therein does not appear to have Mr. Steele-Bodger's support.

For the purposes of this discussion, I propose to divide my remarks into two portions, one dealing with what Mr. Steele-Bodger saw, and another dealing with what he heard and his observations thereon.

A sea trip such as our friend was permitted to take renders one receptive. It is exceedingly interesting to hear of the public buildings, especially that of the Pathological Department. Here our interest quickens, because pathology is the handmaiden of clinical medicine. We do possess in England, however, departments of pathology just as extensive and as wonderfully equipped with specimens, and professors, as those of Denmark. I refer to one only, the Thompson Yates Laboratories at the University of Liverpool. I propose later to show, in connection with my remarks upon abortion, samples of the efforts of Professor Glynn to preserve for you fresh specimens collected in the field, from actual cases of abortion. In this connection, a remark on page 8 strikes one very forcibly. With all these buildings and all this equipment of men and materials, and up-to-date farmer has had abortion for ten years. This is rather a sad commentary upon the clinical efforts of his veterinary surgeon. The next sentence explains the reason: "He

had thirty cases the year before last—these were all vaccinated and six of them aborted again last year." Injection of massive living cultures into an infected animal seems to me a first-class method of keeping an infection virulent upon an up-to-date farm for ten years. As I propose to refer to vaccination later, I will pass to the discussion of what Mr. Steele-Bodger heard.

May I be pardoned for presuming that the notes are the result of interviews with, or lectures from, the various professors mentioned. Consequently it is not surprising to find a lot of bald statements without their relevant facts. Taking tuberculosis first, the most important statement is that with regard to young animals. There can be no question that the correct method for the eventual eradication of tuberculosis from our herds is the rearing of young animals free from tuberculosis and, moreover, immune to natural infection. People with Grade A herds would then be able to purchase on the open market. It is topical to refer to Spahlinger's work and the proposed test of his methods on cattle at Crewe. Spahlinger has a herd of cows free from tuberculosis: cows which will resist exposure to artificial and natural infection. I have seen re-prints of X-ray photographs of the lungs of people treated for tuberculosis by his methods. If such results can be obtained in human beings, the clinically-affected bovine should prove a useful patient to respond to this method. This has a greater appeal than the pole axe which, since September, has received official sanction in England. Spahlinger's method ought to be developed and, shorn of any frills, made into an everyday weapon in our armoury in the fight against this great disease in cattle. I notice that in the pasteurisation of milk for human consumption, the slow method is forbidden, whilst that for feeding purposes is subjected to the slow method. Perhaps Mr. Steele-Bodger in his reply will tell us the reason for this difference.

I fear that I was chosen to open this discussion because of my avowed connection with clinical work on abortion. One finds that the more one studies any one disease in detail, the more one is driven to the conclusion that the nature of all disease is the same. We are all deeply interested in abortion and sterility and naturally you expect me to deal with these subjects at greater length. The author carries on the tradition of contagious abortion; clinically I cannot find support for the term; it should disappear from our nomenclature. It is preferable to refer to abortion due to the *Bacillus abortus* of Bang, or any other causative agent which may be operating. The Danish method of dealing with abortion again raises many old and familiar questions. It may be advantageous to deal with the diagnosis of abortion due to Bang's bacillus. A smear from the placenta is examined microscopically and if positive the blood is not examined. Now, gentlemen, the finding of an organism in or on any diseased lesion is not sufficient to conclude that that organism is the cause of the diseased condition which is under investigation. I ask your indulgence for again pressing that Koch's postulates must be applied to any such organism. I have raised the point before and intend to keep on raising it, for there is no more pressing point requiring solution. The fact that no one has yet made the *Bacillus abortus* of Bang comply is astounding. It clouds and fogs the whole question of abortion and we cannot march forward to any progress until this has been effectually dealt with. There are difficulties, but I hope to show that they may possibly be surmounted. The obtaining of heifers or cows, preferably the latter, known to be free from *B. abortus*, is the stumbling block. The agglutination test is no use for this purpose; it is now confidently believed that there are no such things as agglutinins. There are those who hold that the agglutinating properties of any serum depend upon the state of the colloid protein particles of that serum. Infection with micro-organisms brings about certain changes in the electronic properties of these protective colloid particles. Submitting such a serum to an emulsion of micro-organisms may bring about agglutination, but we clinicians know that a negative reaction may be a bad omen, whilst a positive reaction may signify protection. This holds true in human medicine, where the Widal Test is used for typhoid. Further, we clinicians know that vaccines composed of dead bacilli injected into a cow, will cause her serum to agglutinate the bacilli *in vitro*. Also we know that serum from horses suffering from poll evil and fistulous withers will agglutinate the *Bacillus abortus*, *in vitro*. This phenomenon of agglutination should not be taken to mean that the animal is infected with *Bacillus abortus* of Bang. It is certainly very misleading that eminent English professors should encourage our clients to believe that this is true.

An intradermal test on the lines of the double intradermal tuberculin test ought to be explored, using concentrated abortin. I have found that any preparation of *Bacillus abortus*, whether live or dead, injected subcutaneously, will always give a local reaction. If a concentrated extract of abortin will give an intelligible cutireaction then the difficulty is solved. We can then truthfully isolate the infected and infective from the non-infected. The fulfilment of Koch's postulates will be but a matter of time.

Vaccination is practised in Denmark and I gather from the author's remarks that the live vaccine is meant. It is significant that Professor Bang has isolated the organism from the milk of an animal six months after she had been vaccinated. Here is an open lesion for infecting others, from a presumably protected animal. Previously I have drawn attention to sterility following the use of live vaccines, so that one agrees with Professor Bang, senior, who states that he does not consider that this method has been successful. Here in England we have the Director of a British Government Laboratory distributing 20,000 doses per annum of a massive culture of organisms possibly to be passed for months in the milk. The Ministry of Health try to reduce the bacterial count and the Veterinary Director of the Ministry of Agriculture Laboratory issues massive doses of organisms to find their way into the milk.

Isolation is not so easy of accomplishment as may appear, for the first animal to abort in a herd is not necessarily the first one to have been infected. The dangerous infective cow may still be in the herd and have already infected several others.

Professor Neilsen raises many controversial matters. Indeed, this part of the author's paper is a résumé of Professor Neilsen's Aberdeen address. It is rather sur-

prising to find that, since then, there is nothing to indicate that the Professor has made any advance in thought, or in practice. The reference to the corpus luteum on page 14 is rather ambiguous and, no doubt, Mr. Steele-Bodger means that the corpus luteum controls the nutrition rather than is responsible for it. Expulsion of the corpus luteum is not always followed by œstrum in a few days.

The treatment of endometritis by injections of strong iodine calls for some comment. The cows so treated at Aberdeen strained violently. Whilst this is of no moment, perhaps, to the animal (although I fail to see any benefit) it cannot be correct surgery to leave a patient in that condition.

It is not satisfactory to obtain only 73 per cent. of conceptions within six months of cessation of treatment. Animals treated for sterility ought to conceive before six months from the cessation of treatment. The observations upon treated animals should be carried to twelve months from the date of conception, that is, conception, birth and conception again.

The question of removal of after-births raises an old friend of this division. It is good to know that Professor Neilsen is an advocate of removal ; but surely it is possible to lay down more or less hard and fast rules for guidance in the removal of membranes. Early after a normal parturition, or immediately after an abortion or premature birth, is the best time to pass one's hand and a portion of the arm well into the uterus. By so doing, one can estimate the ability of the animal to stand a prolonged operation. One can also in a few minutes decide as to one's ability to effect a complete separation without serious damage to the maternal structures. Here the specimens of membranes prepared by Professor Glynn readily indicate which membranes will detach easily. When there is extensive necrosis they usually peel away easily and completely ; where there is inflammation and intra-placental hæmorrhage detachment is difficult, and if persisted in, fraught with danger to the animal.

Notification of abortion is compulsory in Denmark and Mr. Steele-Bodger, says : " I would that we could say the same." We must consider the difficulties, for even in Denmark, Professor Thompsen and Dr. Plumer cannot distinguish with the naked eye the difference between *Bacillus abortus* lesions, and those due to tuberculosis. How, then, are we to expect farmers to be able to distinguish previous to notification ? Notification means delivering ourselves up to bureaucratic control again, with the pole axe lurking in the distance. The general public do not like the slaughtering policy with regard to diseases of animals. Taking a long view of the matter, the general public is right. Surely it will be possible in the future to deal with foot-and-mouth disease differently. It may take a hundred years, but the solution of the problem is bound to come. So long as this method of stamping out disease is in force, the veterinary profession will be subject to adverse criticism, whether it is deserved or not. The history of the compulsory notification of some diseases, for example, swine fever, is not calculated to increase our confidence. I sincerely hope that the elucidation of the abortion-sterility problem will not be taken out of the hands of the clinicians.

Our best thanks are due to Mr. Steele-Bodger for being such an excellent and keen observer. We could not have sent a better emissary.

Mr. F. CHAMBERS : There is one point in the discussion that would perhaps puzzle many of those present. I allude to the finding of the *B. abortus* Bang in the placenta as proof that abortion exists. In Denmark they apparently make a smear from the placenta, stain it, and are able to say that a particular organism amongst the countless multitudes there is the abortion bacillus. I cannot see how much reliance could be placed on this method as an accurate aid to diagnosis, but I must disagree with Mr. Barker that the finding of an organism in a direct smear is not indicative that the disease is present. For instance, one would make a diagnosis from a smear in cases of anthrax, quarter evil, piroplasmosis, trypanosomiasis, etc., with every confidence. I am inclined to accept the bacillus of Bang as the causal organism of abortion and I feel that this organism has been made to fulfil Koch's postulates by various research workers in different parts of the world. Until the damage which is caused by this organism can be blamed on to something else, I cannot see how we can ignore the *B. abortus* Bang altogether. The same can be said for the agglutination test. It is the best test that we possess to-day and if properly carried out gives very accurate results. That the abortion bacillus is the cause of a lot of mammitis before calving I am very much inclined to believe. Time after time I have seen cows that have had an attack of acute mammitis before calving, abort and give a positive agglutination test. I have also had two cases where the *B. abortus* was recovered in pure culture from the discharges of an affected quarter before abortion and yet the agglutination test was negative. This is one of the vagaries of the test to which Mr. Barker alludes. Since I saw Professor Neilsen at Aberdeen I have used his method and must confess that, since doing so, my percentage of cures has been much higher. When introducing any solution into a uterus that is in a state of endometritis it is essential that the catheter should be guided into each horn of the uterus in its turn, otherwise the solution will gravitate into the least affected horn. This operation is easily done by passing or holding the catheter, which should be of small bore, with the left hand and guiding the former into the desired position with the right hand in the rectum.

Mr. ASTON said he shared the view of Mr. Barker that the mere presence of *B. abortus* in the placenta was not sufficient evidence of the proof of *B. abortus* as the cause of the disease. He thought that the *B. abortus* of Bang had not yet fulfilled Koch's postulates and until he could see a definite series of more extensive and conclusive experiments than those which had been carried out he was not prepared to believe that Bang's organism was the sole cause of contagious abortion. Abortion was merely an outward sign and if the *B. abortus* was the cause, it must produce a pathological lesion.

With regard to the use of the agglutination test as a means of stamping out the disease, he warned them to be very careful. He had had a very bitter experience on a farm most suitable to its use and begun under the most auspicious circumstances. After some six tests of

the whole herd over a period of nine months his client was advised to use B. of A. vaccine.

Having described the formation of the corpus luteum *graviditatis* and *menstruationis* and its close resemblance to the intercellular tissue of the ovary, he suggested that the only difference in the hormonic effect of the corpus luteum and the ovary, was that the corpus luteum inhibited the return of the uterus from its state in heat, rendering the mucosa suitable for the fixation and preliminary development of the fertilised ovum.

He emphasised the fact that practitioners should inform their clients of the sex characters transmitted by the male, such as the influence on such milk production exerted by the bull, and continually note and observe other characters of such great value to the breeder. He thanked Mr. Steele-Bodger for such a breezy account of what must have been a most enjoyable excursion.

Mr. McLauchlin said he saw a fair amount of abortion, and it did not seem to be such a big worry in the ordinary way. After external disinfection of the genital organs, the animals seemed to go on well. He was not so much impressed with the milking record of the bull's family as the Danes seemed to be. If a bull had a good head, he did not bother much about pedigree, but he thought it important that a bull should pass the tuberculin test before being put to the herd.

The Reply.

Mr. Steele-Bodger, in replying to the discussion, began by saying that he did not accept all the statements contained in the paper, and those who criticised it should bear that fact in mind. He had simply recorded what he had seen and heard in Denmark and Sweden and he shared some of the objections raised by Mr. Barker and therefore by Mr. Aston, for the latter appeared to echo the former.

He was just an ordinary practitioner and not an expert in any way and he disclaimed any personal responsibility for any of the assertions which others had made. As a matter of fact, he was quite as entitled to take part in the discussion of the paper as any of the other members; he only regretted that the discussion had been restricted owing to the limited amount of time available.

Mr. Aston had challenged him to take up the cudgels and to defend his paper, but Mr. Aston had taken up such a lot of time discoursing on hormones that he must be brief.

Mr. Steele-Bodger agreed with Mr. Barker that the best way to solve the tuberculosis problem in a herd of cattle was to pay great attention to rearing tubercle-free young stock, and that was what he was endeavouring to do. The experiment he had made convinced him of the desirability of a farmer rearing his own cows and of getting some sort of ventilation in front of them; plenty of light was essential and undoubtedly roof lighting was best. The worst results had always been where he found cattle head to head. If it was found that the Spahlinger treatment was applicable to cattle so much the better.

He would remind Mr. Barker that the rapid or 'flash' method of pasteurising was compulsory in Denmark, but that it was in Sweden that the slow method was adopted.

With regard to the use of the abortion vaccine, he had not found it much use in his own experience and had come to regard it as a dangerous commodity. He had obtained four doses of the vaccine from the Ministry and he had taken it through to Dr. Lewis of the Birmingham University Pathological Department to prepare him two dead cultures as he wished to use the live culture and dead culture each on two heifers in one herd to compare the results. Dr. Lewis had reported that he had failed to find any organism corresponding to Bang's bacillus. He had, therefore, injected the vaccine as it was into the four heifers—the only result so far had been four huge sternal abscesses which had necessitated veterinary attention afterwards. He had since obtained a fresh sample from the Ministry and in this Dr. Lewis had been able to find Bang's bacillus; he understood that no test for virulence was made by the Ministry, and in any case he thought that the label which the Ministry stuck on their vaccine was enough to warn anybody against it.

Mr. Barker had objected to the word contagious abortion and suggested that it should be called Bang's abortion, but Mr. Barker then stated that the fact of the bacillus of Bang being found in a number of aborted placentæ was no proof of the abortion being due to that bacillus; why, then, call a disease by a name when it was not associated with it? Personally, he was of Mr. Chambers' opinion that if the bacillus abortus of Bang was found in the placenta they were justified in thinking that the abortion was due to that, especially if this occurred time after time in the same herd. It was surely more reasonable to attribute the cause to a bacillus which one could find than to one which one was unable to isolate and could only presume.

Both Mr. Barker and Mr. Aston had criticised adversely the agglutination test as a means of diagnosis; no test was infallible, but both these observant critics seemed to have overlooked the fact that both the agglutination test and the complement fixation tests were employed and that if one was negative the case was considered to be doubtful and a further sample of blood was examined three weeks later.

He was now trying the dual tests and adopting isolation whenever possible. It was, perhaps, not the perfect method, but it was the best available.

It was quite possible, in the failure which Mr. Aston experienced in regard to isolation, that there was some flaw in the technique; there must be rigid isolation or it was useless.

Again, both Mr. Barker and Mr. Aston had thrown ridicule upon the suggestion that contagious abortion in this country should be made a notifiable disease, and dealt with by special staffs. These gentlemen said: "Leave it to us, we are clinicians, we are the people who should decide; these officials don't know their job," but several times Mr. Barker referred to Dr. Gwynn and stated that he sought Dr. Gwynn's opinion and advice; Dr. Gwynn was not a clinician, why, then, seek his advice?

Mr. Steele-Bodger urged that clinicians had neither the time nor the facilities for laboratory work; they, as clinicians, should supply the materials to be examined *gratis* by special staffs (competent staffs) in well-equipped State laboratories. As matters stood at present, a clinician was in many instances discouraged from seeking laboratory aid owing to the high fees charged, thus much valuable material was consigned to the dustbin. He urged close

co-operation between the clinician and the laboratory worker; the latter could not advise the former unless the former helped the latter by sending material for examination; the one was dependent upon the other.

With regard to Mr. Barker's objection to the use of iodine for uterine injection, Mr. Steele-Bodger did not think that a little straining mattered—it was of short duration—but the client should be advised beforehand what to expect. There was one point raised by Mr. Chambers which he thought could not be too well emphasised, and that was the necessity of guiding the catheter with the hand per rectum so as to ensure both horns of the uterus being properly treated.

He disagreed with Mr. Barker about the removal of the after-birth; he maintained that it was impossible to lay down any hard and fast rule, each case must be judged on its own merits; he had no use for the man who said: "I always remove the placenta at once, or after two days or four days or nine days, etc."; anyone who always adopted one rigid line of action, irrespective of the case under consideration, was, in his opinion, singularly lacking in judgment. He thought that it was impossible to state when any particular placenta should be removed until it had been examined manually, and the history of the case considered.

With regard to Mr. McLauchlin's remarks, he could only hope that the opinions he had expressed would never penetrate beyond that room. His policy in everything appeared to be to let matters take their own course. Mr. McLauchlin had said that abortion never worried him, he was then more fortunate than his biblical ancestors, whose cows and goats cast their young. Perhaps Mr. McLauchlin used the time honoured billy goat to prevent abortion in his district.

With regard to the feeding of dairy cattle, he was surprised to hear anyone with an accent like Mr. McLauchlin defending the old-fashioned practice of feeding one scoop of this and two of that; it was not so much a question of whether one got more milk through the feeding of a balanced ration, though he believed one did, but it was rather a question of the cost per gallon to the producer.

In conclusion, Mr. Steele-Bodger said he apologised for the scrappy character of the paper; it had been hurriedly written in three nights in the "wee sma' hours," and he had not had time to arrange it as he would have wished; even the proof copy was corrected with the printer's man sitting with his hat in one hand and his watch in the other, whilst he himself had due a consultation thirty-two miles away.

He wished to thank the members for the way in which they had received the paper and those who had taken part in the discussion for their criticism, with regard to which he thought they should all endeavour, so far as was possible, to make it constructive and not destructive. Anybody could pick holes in a theory or in a practice, but that did not help much; was it worth while to destroy a person's belief in any specific thing unless one could offer something better?

LIST OF DANISH EXHIBITS BY MR. STEELE-BODGER.

1. Professor Folmer Nielsen's uterine forceps.
2. Professor Folmer Nielsen's return flow uterine catheter.
3. Professor Folmer Nielsen's single uterine catheter.
4. Professor Folmer Nielsen's 200 c.c. syringe for uterine injections.
5. Waterproof overall apron.
6. Flat cardboard box, containing flat round tin, with press on lid and glass tube, as used for sending piece of placenta and sample of blood to State laboratories in suspected cases of contagious abortion.
7. Four needles for intravenous work.
8. Universal embryotome, with wire.
9. Wire embryotomy saw.
10. Danish milk fever syringe.
11. Aluminium milk syphon, with screw thread at base for retaining in position in teat and fitted with screw on cap.
12. Professor Morkeberg's wound retractors.
13. Special knife, with guard, for perforating vagina and peritoneum in ovariotomy.
14. Two tubes for use in sinuses after trephining, also used as tracheotomy tubes in sow or ewe, to prevent straining.
15. Curved flat canula, with sound and seton trocar.
16. Danish horse shoe, with cork pad.
17. Danish apparatus for tying cows, using a medium chain instead of yokes or double chain.

All instruments were manufactured by Messrs. Simonsen and Weels, Copenhagen.

Army Veterinary Service.

MOVEMENTS OF OFFICERS.

Colonel W. S. Anthony, C.M.G., arrived home from India on the 20th November, and has been posted to Aldershot for duty as Deputy-Director of Veterinary Services in that command.

Major-General H. T. Sawyer, C.B., D.S.O., assumed the duties of Director-General, Army Veterinary Services, with effect from the 1st December, in succession to Major-General W. D. Smith, C.B., C.M.G., D.S.O., who has retired.

Colonel A. G. Todd, C.B.E., D.S.O., proceeded to Salisbury on the 1st December, for duty as Deputy-Director of Veterinary Services, Southern Command.

Lieutenant-Colonel J. J. Aitken, C.M.G., D.S.O., O.B.E., proceeded to Aldershot on the 27th November, and took over the appointment of Commandant, Royal Army Veterinary School, with effect from the 1st December.

Lieutenant-Colonel B. L. Lake, D.S.O., O.B.E., who has been home from India on sick leave, returned to that country on the 1st December.

Captain P. F. Woodland sailed for India on the 1st December, for a tour of foreign service.

Captain J. H. M. White sailed for Egypt on the 5th December, for a tour of foreign service.

LONDON GAZETTE—WAR OFFICE—REGULAR FORCES.

December 15th.—The following appointment is made: Comdt. Royal Army Veterinary School—Lieut.-Col. J. J. Aitken, C.M.G., D.S.O., O.B.E. (Dec. 1); Capt. T. Hodgins is secd. for duty with Sudan Def. Force (Oct. 24).

Parasitic Bronchitis in Cattle.*

By R. H. Penhale, O.B.E., M.R.C.V.S.,
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The subject of this essay is an interesting one, and important in two respects: (1) Especially does it concern the members of this Association, who are practising in the country, as during the autumn months a good deal of time is taken up in dealing with this disease, and it means a great loss of money to those engaged in the occupation of rearing calves. (2) The subject of parasitology is embraced by it.

Parasitic bronchitis is also known as husk, hoose, verminous bronchitis, or paper skin. It is a bronchial irritation, arising from the presence in the air passages of nematode parasites, termed strongyles.

The disease is widely distributed, being general all over England, and in certain seasons the counties of Norfolk, Lincoln, Cambridge, Cornwall, Devon and some parts of Somerset suffer greatly. It is of most frequent occurrence among calves under a year old, and chiefly in the later summer and autumn months. Although infection takes place some weeks earlier, the symptoms are not shown until the worms become developed. The disease is much more general and severe in wet seasons, notably last year, when all the young cattle on many farms were affected. Certain lands and pastures appear to be more favourable to the disease than others, *viz.*, low-lying districts which are often swamped by over-flowing rivers, or wet, marshy, over-grown lands. It is also noticed more in animals fed on old permanent pastures and old clover, and especially where stagnant ponds and ditches are found. Over stocking and inattention in not frequently changing the young stock from one situation to another, combined with a lack of nourishment immediately after weaning and during the summer months, are also important factors favourable to the development of the disease. It is a fact that calves and yearlings, reared and fed indoors and excluded altogether from pastures, rarely get an attack and, if it does occur, it is through fodder grown on infected land. Also, when calves are housed by night and have a liberal diet, even though turned out by day, they often pass through an epidemic showing little evidence of the disease, and if they do get an attack it is generally very mild.

One places the parasite which causes this disease, as follows:—

Kingdom: Animalia.
Sub-Kingdom: Nemathelminthes.
Class: Nematoda.
Order: Eunematoda.
Super-Family: Strongyloidea.
Family: Metastrongylidae.
Genus: Dictyocaulus.
Species: Dictyocaulus viviparus (Strongylus micrurus).

* Paper presented to the Western Counties Division at Plymouth, on November 19th, 1925.

Historical.

Verminous bronchitis has been known, in all probability, for not less than 200 years. Cobbold, in 1875, furnished us with the first information of the life history of the parasite and, in 1913, Richters published a paper on lungworm disease in deer and sheep and gave us more information, which Daubney, in 1920, increased. The *Dictyocaulus viviparus* is a thread-like worm, and the caudal pouch is small. The spiculæ of the male are short and strong. The mouth is circular and nude. The sexes are distinct. The male is brownish-yellow in colour, and from one and a half to two inches in length. The female is white in colour and slightly longer. The body tapers to a short, sharp tail. The vulva is mid-way between the extremities. Under a microscope, the oviducts may be seen packed with eggs, and it is estimated that each female lays about 300.

The *Strongylus pulmonalis* has been found in calves on rare occasions. Its description is as follows: The mouth is circular and is surrounded by small papillæ; the caudal pouch of the male is bell-shaped, and is provided with seven ribs. The tail of the female is attenuated, tapering to a sharp point. The male is one to one-and-a-quarter inches long, and the female one-and-a-quarter to one-and-a-half, and it gives rise to the same condition as the previous parasite.

Development.

In the adult stage, the worms inhabit the air passages and it is there that the eggs and embryos are produced. According to some authors, the embryos cannot become matured in the bronchi of their host, and they are expelled through the respiratory passages and so reach the ground, and here they develop in the media present, *i.e.*, water, soft mud, etc.

The view generally accepted is that the eggs of the worm hatch in the bronchi and bronchioles; the larvæ ascend the trachea to the pharynx; some are swallowed and pass out with the manure and others are expelled through the respiratory passages. The larvæ are 280 microns long and 25 wide. They have a button-like head and a rather blunt tail. The eggs are 88 microns long by 55.

The eggs of *D. viviparus* escape from the body of the female and contain actively motile embryos still enclosed within an intact vitelline membrane. Under suitable conditions of temperature and moisture the eggs hatch and liberate embryos, which do not feed or grow but undergo a moult in the course of one to two days, retaining the old cuticle. A second moult occurs in from twelve to forty-eight hours after the first moult. The larvæ retain the skin of both moults. Completion of the first moult, *i.e.*, casting of the first cuticle, occurs twelve to forty-eight hours after the second moult. The larvæ retain the cuticle of the second moult. The final stage larvæ, *i.e.*, those which have completed the first moult, migrate under favourable conditions of temperature and moisture on to upright objects such as blades of grass, etc. The final stage larvæ possess a high degree of resistance to cold and to drying. They will remain

five months in a thoroughly dry state, and even then revive when a suitable occasion arises, but they are unable to withstand extreme desiccation. It is said that animals may be infected with a parasite by feeding final stage larvæ. They, in all probability, travel from the alimentary tract to the lungs by way of the blood stream. The worms attain maturity about six weeks from the time of infection. This would seem, most probably, to be the natural method of infection. Moisture is necessary for the development of the different stages, although the third stage larvæ possess a greater degree of resistance to desiccation than do the earlier stages. Development takes place through quite a wide range of temperatures, and so during a mild winter, as occurs not infrequently in the British Isles, the life cycle of the worm could proceed almost without interruption. At one time it was thought that an intermediate host was required for the completion of the life cycle, but this view is not now supported.

INFECTION.

The taking in of final stage larvæ with the food would appear to be, if not the only method of infection, at any rate the usual one, according to Daubney. And probably the route followed by the larvæ in their migration from the alimentary tract to the lungs is by way of the blood stream, and calves, one to eight days old, have been found infected with lungworm disease. This is undoubtedly a case of intra-uterine infection. Dr. Salmon, who investigated the development of the gape worm, *Syngamus trachealis*, in birds, states that: "It is not necessary that the parasite should pass any period of its existence outside the bird's body, although it is capable of living and partially developing under such conditions. The eggs may escape from the adult female worm in the trachea of the bird and hatch and embryos develop and increase indefinitely in the body of the host after the first infection has incurred." It is quite probable that both methods are in use for the development and propagation of the worm which is the cause of this disease.

The question of the route by which the parasite reaches the lungs is an interesting one, and will bear discussion. Dr. Crisp, in an essay read before the Bath and West of England Agricultural Society, says that they first get into the stomach with food or water, and during the act of rumination they are carried up into the mouth, and they then enter the trachea *via* the larynx. Another view is that the embryos are drawn into the trachea during inspiration, and here develop and deposit the eggs. I think that the circulatory method is the actual one. Williams says that the worm larvæ taken up with the food enter the circulation from the alimentary canal by penetrating the bowel wall and they are in this way conveyed to the lungs and there deposited, this being a predilection seat for their further development. Here he supposes that they become matured, pierce the tissues and enter the bronchi to set up the irritation symptomatic of the disease. This, he says, partly explains the fact that young animals are attacked more often than adults, their tissues being more permeable, and he himself has found the parasite in the circulation and in the cavities of the heart.

The supposition that young calves only are attacked is erroneous for, whilst admitting the much greater frequency of the disease in them, adult cattle do suffer, and in them it is often complicated with pneumonia. Older cattle have greater resisting power than young ones, and so do not show infection so much.

LESIONS.

The adults of *D. viviparus* inhabit chiefly the medium-sized and smaller bronchi, and they are collected in masses in which they lie side by side. They produce bronchitis and peribronchitis, with a fibroblastic reaction involving the peribronchial alveoli, and the worm brood produces a condition similar to the above in the smaller bronchioles and, if they get into the alveoli, pneumonia is set up. The mucous membrane lining the trachea, bronchi and bronchioles is the part most affected, but in severe or prolonged cases the submucous coat becomes involved and later the cartilages of the bronchial tubes and the adjacent parts of the lungs. The first stage may be regarded as mechanical and is of the nature of a chronic congestion and swelling of the mucous membrane which, if not relieved, will be followed by acute bronchitis and pneumonia. This stage is followed by an enormous exudation or effusion into the lumen of the tubes. This secretion is catarrhal in nature and is provided partly by the blood vessels and partly by the epithelial cells and mucous glands; it consists chiefly of mucous, leucocytes, and shed epithelial cells. In the later stages the secretion becomes more and more opaque from the presence of increasing numbers of leucocytes, and it may contain cells in a state of fatty degeneration, and is often blood-stained.

Sometimes the smallest tubes at the base of the lungs are filled with material like thick green pus, and if this part of the lung is cut and the surface squeezed, drops of this pus will ooze out. If, instead of clearing up, the inflammatory process continues, the fibrous coats of the bronchi become thickened and infiltrated with leucocytes; the muscular fibres are atrophied by pressure and the cartilages and the mucous glands disappear from the same cause. Ultimately, in many cases as a result of this, the bronchial tubes become dilated and form fusiform or cylindrical wide channels called bronchiectases. All this leads to structural alterations in the lung itself, and we may find lobular collapse, broncho-pneumonia and, in chronic cases, vesicular emphysema.

Lobular collapse occurs in isolated lobules when the bronchial tubes leading to them are blocked up with mucous and worms, since, if a tube is plugged, the retained air, being stagnant in contact with the pulmonary capillaries, undergoes absorption—just as air is absorbed which has escaped into the subcutaneous tissues. If a large number of these tubes become filled up in this way a common ending is death from asphyxia. Considerable areas of lung

may be rendered functionless in this manner. The extent of the pneumonic changes would appear to depend largely on the severity of the infestation, the age and condition of the animal affected. In bronchial pneumonia the consolidation is scattered throughout the lung in the form of nodules, mostly separate, but sometimes collected closely together, so as to form larger masses. These patches are reddish brown or grey in colour and often areas of collapsed lung accompany the consolidation. When the lobules near the surface of the lung are attacked they generally give rise to some pleurisy.

SYMPTOMS.

These vary somewhat, depending on the number and location of the parasites. At the commencement of an attack, when the parasites are not numerous the symptoms are slight, but they become more marked as the bronchi become invaded. At first, the symptoms are those of a bronchial catarrh. There is only an infrequent cough or husk, which becomes more evident if the animals are hurried or excited. The appetite, rumination, and general condition are at this stage undisturbed, and the respiration and pulse may be quite normal, except during these attacks of coughing, when they rapidly become accelerated. If the disease advances the cough comes on in paroxysms which become longer, more frequent and distressing, while other symptoms make their appearance. The appetite becomes impaired, there is a rapid falling off in condition and a discharge, which may be blood-stained, from the eyes and nose, the coat becomes stark and staring, and the animal looks unthrifty. The temperature rises, but is not markedly high, respiration is accelerated, due to the plugging of the bronchi. When driven, the respiration is easily disturbed, the animals become quickly fatigued and rest with head lowered and mouth open, and they cough often. If a herd is moved up to the gate of a field by a dog they constantly cough if badly affected. During the fits of coughing the animals become very distressed, the head is extended and there is a dribbling of saliva while, in the more advanced cases, stringy blood-stained mucous is coughed up, in which the parasites may be seen or the ova discovered under a low power of the microscope. At this stage anæmia and emaciation will be apparent, and diarrhœa may be an accompanying symptom. Auscultation will reveal greatly increased mucous râles.

In the milder attacks, complete recovery may take place in three to four weeks, but if the disease progresses animals gradually become weaker, the eyes sink, and death may occur from general debility, hæmoptysis, or asphyxia, or bronchial pneumonia.

Pneumonia may set in as a complication or sequel, and is caused by extension of the inflammation from the bronchi and usually both lungs suffer. If it attacks the younger stock, it is often rapidly fatal, but adult cattle are more resistant. The symptoms are really an aggravated condition of husk—there is a rise in temperature—104/106 degrees F. The respiration and pulse are accelerated. The membranes are first injected and later of a yellowish tint. The nose is dry, hot, and dirty, and foaming at the mouth is common. There is great thirst; the appetite, rumination, lactation (if cow) are entirely lost, and the cough is much deeper, violent and more painful. On percussion, dull areas will be located—more evident at the base of the lungs, and on auscultation the breathing will be found to be chiefly bronchial, and wheezing and mucous râles can be heard. Abortion is common in pregnant animals. From here the animal may begin to improve under treatment and recover. On the other hand, the condition may become more acute, when there is dyspnoea, peculiar harsh breathing with grunting at every expiration, and often the breathing is oral, as if the beast is suffering from oxygen starvation, doubtless due to the plugging of the bronchial tubes by the worms, larvæ, and exudate. Death generally occurs in these cases in a few hours.

POST-MORTEM.

If an animal has died from the disease, the wasted condition of the carcase will be noted. The membranes are pale, and there is a discharge of frothy mucous from the mouth and nostrils. The blood in the superficial veins is watery and scanty: there may be serous effusions into the pleural, peritoneal and pericardial sacs and the right side of the heart will be dilated. There are no very characteristic lesions in the abdominal cavity, but the worms may be found with eggs and larvæ in the alimentary tract, and if diarrhœa has been a complication the bowel wall will be inflamed and in this case intestinal parasites will be found. The bronchi contain an excess of mucous which is often blood streaked, and in the case of the larger bronchi may be somewhat frothy. The mucous membrane of the larger bronchi shows little change. The commonest sites of the adult worms are the medium-sized and smaller bronchi. They are usually observed lying partly in the first branches of the bronchi and partly in the sub-branches given off from these. From this situation downwards to the smaller bronchi numerous adult worms may be found. In the intralobular bronchioles adults are never found, only ova and larvæ. Less frequently, a few are found in the main bronchi and a few in the trachea. They are disposed longitudinally in the bronchi, and are usually collected in masses in which they lie side by side. Occasionally they plug the lumen of the bronchus completely. The mucous membrane of the bronchi in which the worms are found is generally swollen and reddened.

The changes occurring in the lung vary in intensity and the extent of tissue affected in direct proportion to the numbers of worms present. If only a few worms are present the lung lesions may be limited to a few lobules, and if there is a heavy infestation the changes may involve large groups of lobules up to a point where more than half the entire lung, or both, is undergoing changes.

The surface of the lungs is rough and dull and displays dark red or greyish areas, varying in size from one lobule to a group of lobules. Emphysema may

be noted chiefly at the lower edges and apical lobes, and the lungs appear œdematous. Most of the changed areas are slightly raised from the remaining surface of the lung, but some few are slightly depressed.

On cutting into the lungs, circumscribed areas of hepatisation will be found, or even atelectases and, in advanced cases, small abscesses. If hæmorrhages have been frequent, the lung in parts may be of a dark red or purple colour and pulpy in nature like a piece of spleen. A muco-purulent exudate oozes from the bronchioles in the affected lobes on pressure, and this exudate,when examined, is found to consist of leucocytes, epithelial cells, the ova and larvæ of the worm.

DIAGNOSIS.

In the ordinary cases of husk, diagnosis is simple, and no difficulty is likely to occur. The symptoms are more or less characteristic and the history, combined with the ages of the animals, the number attacked, and the time of year, are sufficient. It is chiefly in isolated cases in older cattle, when broncho-pneumonia develops, that mistakes may be made. Such cases may be confused with:—

1. Contagious bovine pleuro-pneumonia.
2. Pulmonary tuberculosis.
3. Ordinary bronchitis and broncho-pneumonia.

Husk may be distinguished from these by the fact that there is very little elevation of temperature, the general health is not much affected at first, the breathing is bronchial, the cough is characteristic, and microscopic examination of the sputum coughed up or obtained from the throat should contain ova, larvæ, or portions of adult worms. Often, when coughed-up mucous is put in a cup of warm water, worms can be noticed to be moving in the water. Microscopic examination of the fæces will, in all probability, reveal larvæ of the worm, because they are passed with the fæces. Examination of the sputum with a low-power of the microscope will generally be sufficient to find the larvæ, etc., but a fæcal examination may be employed as well. A small quantity of fæces on a glass slide, diluted with a small quantity of water, or saline,and examined under a two-thirds objective, is the simplest way; another very good method to use is as follows: emulsify a small quantity of fæces in a saturated solution of common salt by shaking vigorously in a test tube. Filter this through a small copper wire sieve (100 meshes to the inch) into a conical flask, which is then filled to the brim with the salt solution. Allow to stand for a quarter of an hour and take three loopfuls of the surface solution with a wire loop, dipped just beneath the surface and put on to a glass slide and examine under a microscope. The clinical condition, with the presence of the eggs, will give a definite diagnosis of husk. A worm infection does not always turn into a worm disease and so a diagnosis of worm disease should only be made when the finding of eggs of a pathogenic species is backed up by a typical history and clinical picture. If one has a dead animal from an ailing group, one can make a *post-mortem* examination and be guided by that. In the near future, in all probability, examination of a blood smear for migrating larvæ will help diagnosis.

PROGNOSIS AND MORTALITY.

This depends on the age and constitution of the animal, the severity of the attack and the treatment adopted. In its milder forms, it is not very serious, and many animals harbour the parasite without showing any signs at all, but if an attack is neglected and complications set in the death rate is high. If an animal is in good condition at the commencement it will withstand an attack well and one can give a good prognosis.

TREATMENT.

The principles to be aimed at are the immediate arrest of further infection, the maintenance of general physical conditions, the destruction of the worms, and the interruption of sequelæ, such as pneumonia. Animals should be taken away from the place of infection and, if a single animal, it should be isolated in a well-ventilated box. Good feeding on an easily digested diet will bring about a good physical condition. Tonics, combined with medicine given to destroy worms and larvæ in the intestine and stomach, may be given. It is said that pulped onions and turnips are very useful when mixed with the feed.

The situation occupied by these parasites has presented difficulties in their expulsion which do not apply to most parasites occupying other portions of the body. Good results follow the administration of drugs which are excreted by the lungs and, in the milder cases, this method is quite sufficient. Larvæ and eggs in the intestine would be killed by these drugs. Turpentine for this purpose is regarded by some as a specific and is given in linseed oil. Asafetœda is also well spoken of, and other drugs used are carbolic acid, creosote, creolin, camphor and clove oil. In some parts of the country it is the custom to treat husk by administering agents through the nostrils, the idea being to form a more or less continuous inhalation. The head is slightly elevated and the liquid is poured into the nostril with a spoon or injected with a syringe and allowed to vaporise there. It often gives rise to violent sneezing fits. Some of the drugs employed are turpentine, tar, ether, chloroform, ol. succini.

Fumigations. Many cases are treated, with good results, solely by fumigations. The animals are enclosed in a small house with closed doors and windows, and a gas is then generated, which is inhaled and destroys the parasite. An attack of coughing is usually set up, during which many parasites are expelled. Great care is needed in regulating the fumes or the animals may die as well as the worms. The following are used:—*Chlorine.* An earthenware vessel is placed in the upper part of the shed in order to ensure diffusion of the heavy vapour, and the gas is produced by the action of sulphuric acid on bleaching powder, or sulphuric acid on a mixture of common salt and black oxide of manganese. These fumigations should be repeated every other day for a week. For the first time or two, five minutes is long enough,

but later it may be continued for fifteen minutes, but, of course, this depends on the size of the house and the rapidity with which the fumes are generated. The fumes of burning *sulphur* are also commonly employed, this being cheap, effective, and not so irritating and dangerous as chlorine, but the fumigations must be continued longer.

Iodine. The best method of employing iodine for this purpose is as follows: Get two sacks, damp them, place one inside the other and a bucket is placed inside again. A brick is made hot and put into the bucket, and finally powdered iodine is then scattered over the brick. About as much iodine as will go on a sixpenny piece is enough for each calf. When this is ready the head of each calf is held inside the mouth of the bag and so the fumes are inhaled. The time depends on the size of the calf, but it must be stopped as soon as any distress is shown. This may be repeated in three to four days. Tobacco, rags, feathers, hair, horn, vapour of heated tar, cardboard, leather and brown paper are also employed for this purpose, chiefly with the idea of causing the worms to be expelled by coughing.

Intratracheal Injection.

This is probably the best and most popular method of treating husk. It is recorded that it was discovered, at a French veterinary school, that a considerable quantity of water could be injected into the trachea of a horse without much derangement, and this gave rise to the idea that injection of medicine into the trachea might be effective in certain cases of lung disease.

The operation itself is quite simple. All that is required is a big hypodermic syringe (240 m.) and a strong needle about two inches long. The operator should stand on the left side of the animal, whilst an assistant holds the animal, the head being slightly raised. The needle is introduced about midway down the cervical portion of the trachea, without regard to the interannular spaces, and the fluid slowly injected. One can tell if the needle is in the trachea because a whistling noise is produced through the needle during respiration. Quite a number of drugs are used for the purpose. Some of the best are: turpentine, creosote, carbolic acid, creolin, clove oil, prussic acid, chloroform, tr. opium, lysol, corrosive sublimate and iodine, with olive or rape oil as the common vehicle. No serious irritation results from the operation. A few fits of coughing usually occur. The injection may be repeated in three or four days. I have found, in treating big numbers of young cattle, that this injection is greatly beneficial.

When pneumonia develops, the animals must be kept in a well-ventilated house, warmly clothed and well nursed. Stimulants and expectorants should be given and application of mustard plasters to the sides will help. Inhalations medicated with creosote, eucalyptus or terebene may be employed to relieve the air passages.

In treating husk in a bunch of young cattle, one must remember to prevent re-infection. Change the cattle on to dry and fresh pastures and they should be housed at night, if possible, and well fed.

Prophylaxis.

As it is certain that low-lying pastures are more liable to produce husk than high and dry ones, we may advise that young stock should be kept on the higher ground. They should be housed at night and not allowed out too early in the morning, especially if it is damp weather, and when let out they should be allowed to drink from a good drinking trough of clean water, in order to prevent them from drinking from infected ponds later. In some parts of the country it is the custom, during the time the animals are out, to give with the manger food some substances which will destroy the larva of the parasite as soon as it reaches the intestine. Salt and copper sulphate are used. Stockholm tar is also given as a drench occasionally. An animal which becomes affected should be separated from the healthy ones, and care should be exercised in introducing new stock. Infected pastures should be left unstocked with young cattle. It must not be lost sight of that the sputum may often be swallowed, and that, therefore, the fæces will be infective, as well as the coughed-up mucus. Consequently, when infected animals are housed all bedding and discharges should be destroyed as well as contaminated food, and the house and mangers disinfected. Infected pastures should be treated with a dressing of salt, lime or copper sulphate solution. Young stock should be well fed, as an added precaution, to prevent serious infection and, by changing the animal rotation on pastures, risk of contracting the disease will be lessened.

Discussion.

Mr. John Dunstan, who opened the discussion, said: I must congratulate Mr. Penhale on the thoroughness with which he has dealt with his subject. He has missed no opportunity of consulting all the known authorities and given practically every opinion of everybody of note who has written on this subject. Among other things, Mr. Penhale has mentioned the examination of the fæces. This is quite easily done by the salt method, or by one much simpler—by filtering the fæces.* There are three sieves: the first one has twenty meshes to the square inch, the second sixty meshes, and the third a hundred. I well remember one case which I saw over thirty years ago. A farmer called me in to see a herd of cows, all of which were not only very thin, but were all coughing badly. I later had an opportunity of making a *post-mortem* on one and found the animal very badly affected with husk. I had a clear case to deal with, and naturally assumed that all the others were suffering from the same disease. That was a case in which an experienced man might be excused from dealing with it as though it were a case of tuberculosis. Another case, which was neither one of husk nor one of tuberculosis, which I saw the other day, was that of a cow with a long-continued history of gradually getting thin and wasting and constantly coughing as well. Another practitioner and myself examined the lungs and agreed that they were in a rotten state. We concluded that the animal had not one inch of sound tissue; she was

slaughtered and then I found that her lungs were absolutely healthy. We were both entirely deceived, which simply shows how difficult it is to rely entirely on clinical examination. We could not find out what made the cow cough.

With regard to treatment, there is no doubt that intratracheal injection is the most satisfactory. It is very simple, and is easily carried out. Some of you may have seen the results of some researches made by a German who explained how the embryos could be destroyed in the intestines before the worms were fully developed. He gave calves 1 dram of a mixture of one part of copper sulphate to 99 of common salt, and claimed very successful results. If the object was achieved the animals did not get husk at all, because the parasites were all destroyed in the embryo stage. The idea seems to be thoroughly sound.

I think there are one or two points upon which we might have the benefit of the experience of some who are here. It is believed that turning calves on to young clover increases husk. This should not be so.

With regard to food, the ancients always told us that rape and the tops of white turnips were very injurious to the husk parasite, and I believe it is so. As a rule, if you feed animals on them they improve. I advised a man some time ago to put some calves on clover. He put seventeen on, and kept them there for two or three days and then found they were all blind. I do not know if you have found that, but if you keep calves on rape they will go blind.

How much, to the acre, should one salt to rid the pasture of the parasites? I am rather doubtful myself if any good is done, but somebody may be able to give us some first-hand information.

Fumigations are very useful. I may say that I was told that, in the matter of fumigation, the animals had almost to reach the point of death before anything could be done which was really effective, so on the strength of that I decided to go inside with them. I did, but I vowed I would never do it again. (Laughter). They coughed furiously—and so did I, but I came to the firm conclusion that I was not the man for that sort of thing. (Renewed laughter). It may be very useful, but I do not think it would kill the embryo in the intestines.

Turpentine is very valuable to us in the treatment of husk, but Daubney says it has no effect on the embryo forms. I have seen some very good results following on its continued use.

The life history of the parasite is clear; we all know what a terrible plague husk is in the West, and if we can benefit by the experience of others it will be all to the good. As a rule, if calves are caught in the early stages it is very rarely that they require a second injection, and farmers come back year after year and seem highly pleased with it. It is very rarely that one meets with an accident; in fact, I do not remember hearing of an accident except a few weeks ago when I had one case. It is apt to occur occasionally.

Mr. GIBBINGS: Mr. Dunstan says he is quite clear upon the life history of the parasite. How does he account for this—that if you take an infected animal and put it in a shed with others that are healthy, in about three weeks time you will find the others have developed husk too?

As regards Mr. Dunstan's method of preventing the disease, it appears to me that a teaspoonful must be a very infinitesimal dose to kill the parasite. A client of mine told me some years ago that he had lived on his farm for forty years, and his calves had always been affected with husk. What could he do to prevent it? I ascertained that his calves were always turned on the same field, and told him that that would undoubtedly help to infect them, and I advised him to give the field a good liming. He told me the other day that he had done so, and since then not one calf in that field had been infected. I had one or two animals die rather unexpectedly after injecting; about a week afterwards they developed some affection of the larynx and later had an abscess form in the trachea, and when you get an abscess formed it sometimes proves fatal.

I believe the best means to prevent the disease is, as Mr. Penhale says, to keep your calves off old pasture and house them at night, feeding them liberally. When once infected, Mr. Dunstan says, 'keep them off clover.' I suppose he means second crop clover, because I do not know of any better pasture to put animals on when they are affected with husk. Turnips and rape and seed are the best foods. Mr. Penhale has given us a very good paper. I know he has had a very great deal of experience on this subject.

Mr. FRASER: I cannot see why putting calves on clover should increase the husk.

Mr. FERRIS: It is the first cut when the clover buds come up. There is a lot of moisture about on dewy mornings, but I should think animals must be infected before they get there. I think it is a good place to put them if they have got the disease.

Mr. F. T. HARVEY: I am sure that we are all very much obliged to Mr. Penhale for his paper. There is just one point I should have liked to discuss, whether the injections kill the parasite. When you introduce the material into the trachea and it relieves the disease, does it kill the parasite?

I have found them living after an injection, and, therefore, I would like to get some information as to how the injection really acts. I had an idea that it acted as an expectorant, and the animal was enabled to expel mucus. If you have a lot of thick mucus, worms are entangled and hold. I have very grave doubts about their being killed. The other day there was a severe outbreak of lung disease in pigs. Chloroform vapour was injected and it was very effective. In that case there was some evidence that it actually killed the parasites. Should you use the injections if there is any indication of a pneumonic condition? Many animals have some amount of pneumonia, and my experience is that injections are rather harmful then. The question is, which is the better injection to use? Some use one and some use another. I have made a lot of enquiries, and it is really extraordinary how many different views men hold with regard to this matter of injections. Many go on and say they have no trouble at all, and yet there are others who give up the use of injections altogether on account of disasters. The matter is not quite so simple as it seems. Then there is the question of emphysema. I do think that some of the fattest animals that look absolutely well develop first of all husk, and then eventually die of fatness and emphysema. The circulation

of the lungs becomes held up, the heart becomes very dilated, and the animals die of oxygen starvation.

Fatalities are due to added infections by microbes on the lesions themselves. Personally, I think that with good management, giving the animals plenty of fresh air and sustaining food, a great deal can be done to help recovery, but one difficulty that is nearly always present is lack of housing accommodation. Many animals are put in byres under such bad conditions that the whole thing is hopeless.

Mr. GIBBINGS: In reply to Mr. Harvey, I believe the effect after intra-tracheal injections is largely due to chloroform. An animal has a violent fit of coughing, gets the parasites up and then swallows them. If an animal does not cough it dies. I have injected a calf, that was very ill, three or four times, and then, after a *post-mortem*, I have been surprised to find the trachea blocked up with parasites. It has been of no effect where the animal cannot cough. I remember I made one injection—I admit the animal was in a moribund condition—and later I found that he was dead, and after making a *post-mortem*, I found the microbes were all alive. I do not believe that intra-tracheal injections kill the parasite.

The PRESIDENT: I think our thanks are due to Mr. Penhale for his very interesting paper.

With regard to Mr. Dunstan's remark about calves in clover and rape going blind; I take it they get their sight back. In my district I do a little intra-tracheal injection, but have had some unfortunate results. I used Mr. Dunstan's prescription, and still use it with good results, but I thought at one time I was offered something better. I injected over twenty calves very slowly, and by the time I had got to the fifth or sixth the first was stretched out. It was not dead. Later I had five lying down. They got up later. I usually give one injection and repeat it in a week's time. I was called to a case once where I found two animals roaring horribly, after injection. They died, and I have never used that again.

With regard to the life history of the parasite, I am like Mr. Gibbings. There is an old saying: 'Never put your calves out to grass until the dew is off the grass.' Mr. Dunstan mentioned turnip tops, and Mr. Gibbings mentioned white turnip. I believe in the latter. The farmers in my district believe that it is the smell which is of value, and I am a great believer in it too. Then again I must say that I agree with Mr. Gibbings when he says that a good deal of success with intra-tracheal injections is due to the fact that it makes the animals cough, and I think that ether is the best for that purpose. I usually inject slowly, in the hope that it will trickle down the whole way, and then I give a squirt and get a cough. With regard to copper sulphate, I regard it as a most deadly drug, and I never give a horse more than 30 grains. Fumigation I tried once, but never again. I lost ten of them.

Mr. PENHALE, replying to the discussion, said: In reply to some of the various points raised, the embryos do move up a blade of grass, and experiments show that they will go up the side of a glass door, and movement is quicker in the dark than in the light. When they get to a dry place they stop and go back.

There is no doubt that injections are beneficial. I daresay they do not actually kill the worms, but I have very rarely had accidents, and have never had one die. I do from one to two thousand a year. I have never had an abscess, and I inject as fast as I can. They cough a good deal, but I think the reason that calves fall down is because they have too large doses of chloroform. In summer calves I do the first one and wait to see if he rambles about; if he does, I give the others a little less. I have only had one case of pneumonia, and the day after the farmer sent to say the animal was grunting—it died. If you are injecting a good many I do not think there is much doubt about the best treatment. I have not tried copper sulphate treatment. In regard to the question of putting one animal in a house with others, I think it is evident that the others can be so infected; I had a case this year of that sort of thing. Of course, an injection will not cure every animal. There is no treatment that will cure every case, but if injections are done early and the calves kept in at night, I think farmers should have good luck with them.

Mr. HARVEY: I had a farmer who would insist upon my injecting some hogs. I advised him not to have them done, but he insisted, with the result that two of them died. He would not have any more done.

Mr. FERRIS asked Mr. Gibbings, who, contrary to his experience, had bad results when injecting lambs, if he cut the skin with a lance.

Mr. GIBBINGS: No; I use the needle, and put it right through.

ROADS AND HORSE TRAFFIC.

"The icy state of the roads during the frost accentuated the chronic perils of the highway for horse traffic, and has elicited from local agricultural bodies a fresh crop of well-grounded protests. Even motorists, in whose interests the roads have been converted, discovered lately that they can be made too smooth. Leaders of the motoring section of the public have been apt to assume that in a few years the horse as a means of traction would practically vanish, and that it was consequently unnecessary to make any provision for it. In spite of the enormous multiplication of motor cars, and the proved utility of the tractor on many farms, it is now clear that the horse will maintain an important place in town as well as country traction for a long time to come. The horse has been proved cheaper than the motor for important classes of short distance traffic in cities, and there are few signs of its being dispensed with as at least an auxiliary to mechanical methods on most farms. Thus, although motor traffic now commands as great an indulgence from the public as railway traffic did eighty or ninety years ago, there is a perceptible increase of official recognition that roads must be made accessible to the hoof of the horse, as well as to the rubber tyre of the motor car. Road rates are already so heavy and unremunerative an exaction from agricultural land that farmers regard with at least as great anxiety as any other section of the public the suggestion that any part of the Road Board funds should be drawn upon for general national finance. The roads in country districts are already financed with so much difficulty that if the funds held by the Road Board are to be diverted from their declared purpose it would lead us appreciably nearer to a general breakdown of local contributions, with the almost inevitable result that the expenses of road administration would in large measure have to be assumed by the State. This would be the very opposite result from that aimed at in diverting the Road Board's resources; and in this matter the interest of farmers and of motorists would coincide."—*The Times.*

The Veterinary Record.
19th December, 1925.

*RESEARCH IN ANIMAL BREEDING.**

As a rule, Annual Reports make somewhat dull reading, marking but another milestone and, at their best, frequently assuming an air of apology. The Fifth Annual Report of the Animal Breeding Research Department, University of Edinburgh, is distinctly refreshing. The Director, Dr. F. A. E. Crew, does not regard this one either as a challenge to the sceptical, or a justification of existence. He does not argue that his department must of necessity lead to the profit of the individual, or the State. His work, so he says, " is to endeavour to respond to that confidence, and to provide information that will, in the end, be useful in, and applicable to, the business of practical live stock breeding."

Let us examine the accomplishments of the year ending March 31st, 1925. We find that Dr. Crew himself is continuing his studies in sexual physiology and, while a great deal is being done with the larger animals, some of the more interesting experiments relate to the smaller laboratory animals. The relationship of pregnancy to the organs of internal secretion is being carefully worked out. Distinct changes in the thyroid and the suprarenal gland correspond closely with the various phases of pregnancy. There is, moreover, an unmistakable sex dimorphism of the suprarenal. This work is in process of elaboration, the object in view being to determine the mechanism and cause of reproduction. The experiments involved gonad transplantation in some hundreds of mice as well as rabbits and many hens. This also includes Dr. Crew's well known work on sex reversal.

The important subjects of fertility and sterility come within the scope of several of the capable researchers on his staff. Mr. J. E. Nichols, working on sheep, produces figures proving the benefit that results from " flushing," and others which show that there is a close cor-relation between the climatic conditions at lambing time and the number of lambs reared. *Post-mortem* examinations have been made on many sterile animals and these go to show that sterility is accompanied by marked changes in the thyroid, suprarenal and pituitary.

Other work being carried out on sheep is a series of studies on colour inheritance of the fleece as well as its characters. Mr. Roberts's work is very interesting and of great practical value both to agriculture and to industry.

Another subject of interest in certain breeds is the inheritance of achondroplasia in cattle, *i.e.*, the bulldog calf. Investigation has shown this to be hereditary and its mode of inheritance simple. It is a Mendelian character and can be eliminated from a race by the application of Mendelian principles of breeding.

*Report of the Director, Animal Breeding Research Department, The University, Edinburgh, for the year April 1st, 1924, to March 31st, 1925 (being the 5th Annual Report).

Suffice it to say, that the field in which Dr Crew and his assistants are engaged is a very large one, for the modern conception of genetics appears to lead the workers into many nooks and crannies; and here let Dr. Crew speak for himself: " The Director of a Research Institution does not hope to find genius in himself or his staff. He seeks men with a marked degree of common-sense, which may be methodically employed in the collection, co-ordination, comparison and analysis of experiences. He recruits men who exhibit eager curiosity and fierce self-criticism, men who are capable of deductive and inductive reasoning, and who have a vivid yet disciplined imagination, and tries to create and maintain an atmosphere in which these qualities flourish. He seeks to lead them in the adventurous collection of as many experiences as possible, in order that a clear demonstration of those circumstances in which different variants occur may be obtained."

It is sometimes said that the age of adventure is dead. After reading such a report, one is inclined to feel that there are avenues of adventurous exploitation other than the discovery of new lands.

The work of the department is of necessity slow, as our domestic animals are slow breeders. We understand that these valuable results are being obtained on a small expenditure of £3,000 a year. We feel that work of such first-class importance ought to be better supported.

We are glad to know that the services of the distinguished honorary member of the " National," Dr. Crew, are being utilised by both the veterinary colleges in Scotland. A knowledge of the fundamentals of the science of genetics is of immense importance to the veterinary surgeon, especially to those engaged in practice in our great breeding areas.

We cannot refrain from commenting on an interview appearing in a lay paper with a member of the Royal College of Veterinary Surgeons (but alluded to in the interview as a " Vet.") who has apparently ceased to practice and taken up dog breeding.

Perhaps the " interview," as recorded, was not submitted to the person in question for acceptance, or otherwise. It does seem, however, to say the least of it, in bad taste to allow an article to appear which seems to have for its object the advertisement of the dogs but, at the same time, giving the professional life-history of the owner. Such an article would naturally lead the public to believe that the holding of the Diploma of the Royal College of Veterinary Surgeons and dog breeding and dealing go hand in hand. By all means let an M.R.C.V.S. take up dog or horse or any animal breeding and dealing, but the professional qualification should be sunk in connection with the trade.

It is our view that the buying and selling of animals, or even the acceptance of a commission for " finding " an animal for a client, should be studiously avoided by a professional man, otherwise he may find his professional surgery labelled " The Cat and Dog Shop " and himself be better known as " the dog dealer " than as a professional man. We are aware that such " conduct " does not come under the category of " unprofessional," as interpreted by the Royal College bye-laws and therefore cannot be dealt with by the Council—it is a matter of individual dignity and we are glad to think that by far the larger proportion of our members have so imbued in them that dignity for upholding their profession that in time we may be alluded to by the lay press as Veterinary Surgeons and not by that dreadful relic of the past, " The Vet."

CLINICAL AND CASE REPORTS.

An Unusual Accident.

By J. R. Rider, M.R.C.V.S., Darlington.

On 11th November, an old pit pony ran away from his work in a drift. On arriving at the surface, he deviated from the straight path, and plunged into a sunken tar pond, situated a few yards to one side. Steam was being forced into this tar, which was then pumped into tanks. The depth of the pond is uncertain, but on the arrival of the horsekeeper the pony was completely submerged, little being visible beyond the back straps of the harness. A board was placed under the jaw to support the head, ropes applied, and after strenuous endeavour the animal was extricated.

When seen by the writer, an hour later, fair progress had been made with the cleansing process, the men using linseed oil followed by soft soap and water. They reported that " lumps of tar " had been removed from the mouth and nostrils; special efforts had been made to remove tar from the eyes, and a pint of linseed oil had been given as a drench.

The eyelids were much swollen, and the conjunctivæ presented an appearance of intense inflammation, while the nasal and buccal cavities appeared to be free of tar. A doubt was felt as to the quantity of tar which might have reached the respiratory and alimentary tracts, the circumstances suggesting the possibility of toxic symptoms by these channels. The skin was cleansed without further incident.

More appropriate means of treatment were not immediately available, and as a temporary measure ordinary white lotion was diluted so as to contain about 4 grains to the ounce each of zinci sulph. and plumbi acet., to be used a collyrium. The animal was dried, rugged up, offered oatmeal gruel and left for the night.

On the following day muscular tremors were seen, the pony being somewhat reluctant to take gruel. The collyrium was changed to a weak solution of silver nitrate, applied twice daily, with drops of castor oil in the intervals. Sodii sulph., combined with p. zingib., alternating with a diffusible stimulant (spts ether nit. and spts ammon. aromat.) were each given twice a day, while the skin was dressed with a mixture of equal parts of ol. rapii and aqua calcis. Dark-coloured urine was passed in copious amount, but defæcation was suspended.

On the 13th, sodii sulph. was given three times, and fæces were passed in the afternoon, the function having been in abeyance about 36 hours.

The animal was seen again on the 14th. Muscular and eye symptoms had subsided, the skin was clean, shewing no evidence of blistering, and the appetite for soft food was good. There was, however, some stiffness of gait.

The pony was not seen again until the 17th, when the excretory functions were normal, and the gait much improved. The animal had been offered a quantity of " chop," which revealed some soreness of the mouth, with excessive salivation. This diet was withheld, and a mouth wash of pot. permang. used as frequently as possible.

By the 21st the animal was making an uneventful recovery.

The case is interesting in that it was fortunate that the tar was soft, this circumstance facilitating the extrication of the pony, and the subsequent cleansing of the skin. Further, no adverse effects were observed after the liberal application of linseed oil and soft soap. Toxic symptoms from absorption were slight, although an unknown amount of tar must have been swallowed. There were no symptoms of respiratory distress, while the emergency use of white lotion as a collyrium (suitably diluted) was markedly beneficial.

Removing a Wart with Formaldehyde.

One day a client brought a dog to me with a large wart on the antero-medial metatarsal region midway between the tarsus and digits. The wart was of the same size and shape as a good sized hen's egg. Closer inspection revealed two more smaller warts an inch lower down, one medial and the other posterior. The entire metatarsal region and tarsus were enlarged to almost twice their normal size. The dog held the leg up, very seldom even touching it to the ground. The gluteal muscles showed marked atrophy, and the animal was in poor condition with very little appetite.

The animal was a very finely bred pointer, two years old, and when a pup was the hope of its owner in winning the sweepstakes field trials, when the largest wart put in its appearance. The owner had the wart removed twice, once by surgery and again by caustics, only to have it return and become larger than before. The owner had given the dog to my client on the condition that if he failed to effect a cure he would destroy the animal. With this history the patient presented a rather belated spectacle.

I decided to remove the warts with formaldehyde, and proceeded as follows: The animal was put under general anæsthesia, although I believe now that local anæsthesia would probably have been sufficient. A plug was removed from the middle of the large wart with a trephine down to where the tissues began to get hard. A pledget of cotton saturated with 40 per cent. U. S. P. formaldehyde was packed in the cavity, taking care that there was no overflow of the solution as the cotton was packed into the cavity. A pledget of cotton saturated in a similar solution was placed over the surface of the wart, using extreme care not to let it come in contact with the surrounding skin. Cotton saturated in the same solution was placed over the two remaining smaller warts, the leg bandaged, and a muzzle placed on the dog.

In five days the bandage was removed. The wart was black and hard. Around the edges the formaldehyde had penetrated the healthy tissues about one-eighth inch, and there was a marked ring around the wart where it was coming loose from the

surrounding healthy tissue. The wart was grasped by vulsellum forceps, and with the aid of a scalpel, which had to be used only in a few places, the wart was removed, leaving a cavity a little larger than the original rim of the wart and over which were the prettiest granulations I ever saw on any wound. The smaller warts were removed in the same manner, and presented the same appearance.

The muzzle was removed from the dog, and he was left to take care of his own wounds, having a grassy yard in which to run and a good clean bed at night. The dog's appetite improved immediately, and in ten days he would put weight on the leg. Recovery was very rapid. It has now been ten months since the operation, and the dog's leg has practically returned to normal, except for a slight scar, hardly noticeable, at the site of the largest wart.

I have used formaldehyde in removing sitfasts and shoe boils and have had equally successful results. Its advantages are that it converts what would be a rather bloody operation into one practically bloodless; it penetrates into the healthy tissue slightly beyond that which it is desired to remove; the prettiest granulations I have ever seen have been beneath diseased tissues penetrated with formaldehyde, and lastly is the rapidity with which the wound heals.—M. W. Emmel, in *Chicago Veterinary Medicine*, November 1925.

Pit Pony Abolition Petition.

A petition urging the Coal Commission closely to examine the possibility of substituting mechanical haulage for ponies in the mines has, says the *Daily Express*, been signed by nearly a thousand influential men and women, and presented to the commission.

The signatories include members of Parliament, leading authors, clergymen and leaders of modern thought. Mr. G. Bernard Shaw, Mr. T. P. O'Connor, M.P., Lieut.-Colonel R. V. Applin, M.P., Viscount Chilston, Mr. J. R. Clynes, M.P., Brigadier-General G. K. Cockerill, M.P., the Marquis of Douglas, Miss Fay Compton, and Earl and Countess de la Warr are among those who have signed.

"On the plea of humanity alone we feel we are justified in making this request," say the petitioners. "We desire that the commission should call and examine evidence from experienced mining engineers in every coalfield on the use of mechanical systems of underground transport in place of horses and ponies, and also on the possibilities of the general adoption of such systems.

"In these days of great and advancing engineering possibilities it seems to us that the question of the continued employment of animals for haulage in mines is one that is very closely allied to the main problems you have to consider, and we venture to ask that this important aspect be given your special consideration."

The paper comments: "The plea to the Coal Commission for the replacement of pit ponies by mechanical transport deserves to succeed. The *Daily Express* would deplore the decision of the question upon grounds merely of sentiment. If the animals are necessary to the industry they must be retained. But if it is possible to replace them they ought to be released. No amount of kindness—and the animals as a rule are treated with the greatest humanity—can make up for the fact that the pit pony descends the pit to remain there in many cases until his death. He cannot be brought up to the surface daily with the miners, but remains in his underground stables for months at a time cut off from the light and the fresh air and the open fields. No animal should be condemned to such a fate if mechanical transport can be substituted without unreasonable loss."

DIVISIONAL REPORTS.

Midland Counties' Division.*

MEETING AT WORCESTER.

The quarterly meeting of the Midland Counties' Division was held at the Star Hotel, Worcester, on Thursday, November 19th. Mr. T. Slipper, of Sutton Coldfield (President) was in the chair, and there were also present: Lieut.-Colonel Marriott, Messrs. L. W. Heelis (Solihull), J. L. Cormack (Coventry), H. L. Pemberton (Bridgnorth), W. F. Aston (Derby), J. R. Barker (Hereford), E. O'Neill (Birmingham), H. Yeomans (Smethwick), J. Robertson (Stourbridge), J. W. Conchie (Kidderminster), J. Franklin (Worcester), H. B. Hiles (Worcester), J. Scott Bowden (Colwall), T. N. Gold (Redditch), J. M. Whyte (Tenby), C. W. Toy (Ludlow), T. O. M. Martin (Wellington), J. A. McLauchlin (Stourport), C. Renfrew (Broadway), H. S. Cockburn (Eastwood), Lindsay Auchterlonie (Nottingham), F. Chambers (Dudley), G. V. Tyreman (Ludlow), Jas. Martin (Wellington), L. C. Tipper (Birmingham), G. F. Banham (Stratford), D. R. Hoddinott (Evesham), W. H. Brooke (Handsworth), H. W. Steele-Bodger (Tamworth), and the Hon. Secretary, Mr. H. J. Dawes (West Bromwich).

Visitors present were: Messrs. E. E. Jelbart (Chipping Norton), J. M. Walker (Ledbury), A. E. Roberts (Chepstow), R. Tindle (York), C. W. Howard (Dorking), B. Sayer (Mumbles, Glam.), J. W. H. Masheter (Newnham), K. D. Turner (Gretton), P. E. Emson (Haverhill), M. L. Dartnall (Cheltenham), A. E. D. Froggatt (Worcester), and B. Secker (Worcester).

Apologies for non-attendance were received from Sir Gilbert Barling, Messrs. T. Ludlow, E. Beaumont, J. H. Carless, W. Beddard, D. Forwell, R. Hughes, A. B. Forsyth, R. L. Phillipps, H. A. Turner, W. E. Ison, H. Tudor Hughes, F. L. Gooch, D. Anthony, E. Ringer, J. J. Burchnall, E. W. Parkes, Jas. Martin, junr., E. Hall, J. O. Powley, R. C. Trigger, A. Hamilton, R. Lake, L. C. Maguire, W. J. Dale, J. C. Deville, R. P. Holmes, W. Mitchell, J. G. Allen, C. J. Clifford, H. Gascoyne, H. C. Gregory, T. J. Prince, H. S. Reynolds, M. Sadler, F. E. Somer, P. M. Evershed, W. White, A. A. Forsyth, G. P. Male, S. M. Woodward, H. W. Dawes, and others.

The *minutes* of the previous meeting were read and confirmed.

Nomination.—Mr. A. E. Ferguson, of the Ministry of Agriculture, residing at Shrewsbury, was nominated for membership of the Division.

Elections. The following gentlemen, nominated at the previous meeting, were now elected members of the Association:—

Mr. G. R. Benbow, of Leicester, proposed by the Hon. Secretary, and seconded by Mr. J. Martin; and Mr. H. C. Gregory, Ministry of Agriculture, proposed by Mr. Aston, and seconded by the President.

* Received on December 7th.

Council's Report.

The Hon. Secretary presented a report from the Council, which met earlier in the day.

It was recommended that, at the next meeting of the Division, Dr. Graves be asked to read a paper.

Among the correspondence before the Council was a letter from the President of the National Veterinary Association (Professor J. B. Buxton) inviting this Association to subscribe £2, the cost of a link in the Presidential Chain of Office, the name of the Division and the date it was formed to be inscribed thereon. It was recommended that the amount asked for be subscribed.

A letter was read from Mr. F. Bullock, on behalf of the Royal College of Veterinary Surgeons, inviting further support for the Frank Garnett Memorial Fund. It was recommended that the Hon. Secretary circularise members for individual subscriptions, and that a list be handed round among those present at the meeting.

The Council's report was adopted, on the motion of Mr. Cormack, seconded by Mr. O'Neill, and the recommendations contained therein were agreed to.

Demonstration of the Clinical Examination of a Sterile Cow.

The subject of this demonstration, which was given by Mr. J. R. Barker (Hereford), assisted by Mr. Steele-Bodger (Tamworth), was a red, aged Shorthorn cow, that had been barren for eight months.

A diagnosis as to pregnancy, despite the fact that the cow had been reported in œstrum and not served, was made. Introduction of the hand into the vagina revealed a parent os and the absence of a mucous plug. There was a slight clear mucous discharge around the cervix. A rectal examination revealed the right horn of the uterus slightly larger than the left, but no evidence of a fœtus. With one hand in the rectum and the other gripping the cervix, the uterus and ovaries were pulled back for palpation. The left ovary was normal and the right ovary cystic, and carrying the corpus luteum of the previous œstrum. It having been decided that the cow was not pregnant, the speculum was introduced into the vagina and, with the aid of an electric torch, the inflamed cervix with the protruding rings could be clearly seen. It was necessary to evacuate the vagina with air from a milk fever syringe to overcome the difficulty of seeing caused by the steaming of the vagina.

The forceps were attached to the superior wall of the cervix, well away from the os, and then the cervix was retracted to the mouth of the vulva. The small non-return flow catheter was inserted and connected with an irrigator containing Lugol's solution in warm water—one ounce to a gallon. Each horn in turn was irrigated and the first return flow examined for pus and debris. A 10 per cent. solution of Collosol Icthyol in glycerine, previously warmed, was allowed to flow into the rubber tube connected with the catheter and, with the finger and thumb on the tube, expressed into each horn. The cervix and the vagina were irrigated freely after the withdrawal of the catheter, and the removal of the forceps.

The animal was then slaughtered. There were gross lesions of tuberculosis in the abdominal organs. The genital organs were in the condition revealed by the clinical examination, distinct evidence of the Icthyol solution being present in each horn.

A hearty vote of thanks was accorded to Mr. H. B. Hiles for the use of his premises, and also for providing the cow for the demonstration.

Mr. H. W. Steele-Bodger (Tamworth) then presented a paper entitled "Notes on a Trip to Denmark and Sweden, with Special Reference to Contagious Abortion and Sterility."

[This paper, and the discussion upon it, which was opened by Mr. J. R. Barker, of Hereford, are reproduced earlier in this issue.—Ed.].

Mr. Steele-Bodger displayed a Danish horseshoe, fitted with a cork pad, also a number of Danish instruments, the most interesting of which was a "universal embryotome." For the full list see the report of the discussion.

The President moved a vote of thanks to Mr. Steele-Bodger for his paper, and to Mr. Barker for his criticism.

The Hon. Secretary, in seconding, said it was a pleasure to know they had young men coming along in the profession who were so keenly interested in their work, and were willing, at the same time, to share with their fellow practitioners the knowledge they had gained.

At the conclusion of the meeting, the members were entertained to tea by Messrs. Franklin and Hiles, two local practitioners, to whom the President suitably expressed the thanks of the company for their hospitality.

H. J. Dawes, F.R.C.V.S.,
Hon. Secretary.

Western Counties Division.*

Meeting at Plymouth.

The autumn meeting of this Division was held at the Duke of Cornwall Hotel, Plymouth, on Thursday, November 19th, 1925, the President, Mr. Charles Masson, M.R.C.V.S. (Torquay) occupying the chair.

There were also present Messrs. P. W. Bloye (Plymouth), H. W. Townson (St. Austell), S. J. Motton (Penzance), H. E. Jackson (Paignton), R. Ferris (Totnes), A. H. Oliver (Devonport), John Dunstan (Liskeard), R. H. Penhale (Holsworthy), C. C. Parsons (Launceston), H. Fraser (Tavistock), H. Gibbings (Tavistock), L. Norman (Chudleigh), E. W. Bovett (Bridgwater), C. Crowhurst (Bodmin), W. N. Wright (Torquay), F. T. Harvey (St. Columb), W. G. Blackwell (Exmouth), and R. Barons Nelder (Exeter), Hon. Secretary.

The minutes of the previous meeting, as published in the *Record*, were taken as read, and were signed as correct.

* Received on November 27th.

Apologies for unavoidable absence were announced from the following: Major Hobday and Messrs. Thorburn, Ascott, Roach, R. H. Smythe, W. B. Nelder, E. R. Smythe, E. C. Bovett, and J. P. Penhale.

Garnett Memorial Fund. — The SECRETARY announced that at the last meeting the President had started a subscription for the Garnett Memorial Fund, and the donations had amounted to about £13. "I had hoped," said Mr. Barons Nelder, "that we should have got at least £20. On the other hand, if there is anybody here who has not subscribed and would like to join in with the Western Counties appeal, if he will kindly let me have his subscription I shall be only too pleased to forward it to the proper quarter."

CORRESPONDENCE.

The SECRETARY read to the meeting various letters from the "National," the first dealing with the matter of representatives from the Division to sit on Committees of the National. The two members who had been elected were the President and the Secretary, the President serving on the Organising Committee and the Secretary on the Finance Committee.

The SECRETARY informed members that he had been appointed a collaborator in connection with the *Veterinary Record*, the idea being to get more interesting articles and improve the production. Members who had material for the *Record*, but had not the time to put it into readable form could, therefore, either forward the matter to him or to the Assistant Editor of the paper, and the "copy" would then be put into shape for publication.

A further letter, dated 28th October, was read from the "National," in which it was suggested that each Division should be financially responsible for one link in the chain of office, that each link should bear the name of the Division subscribing, and that the date of the inception of that particular Division should be inscribed on the link. The hope was expressed that the Western Counties Division would feel disposed to participate in the scheme which represented, in the opinion of most, an extremely nice sentiment, whilst the cost of a link was only £2. "I think," said Mr. Barons Nelder, "that it is a very good idea that each link should represent a Division, and it remains for this Division to decide whether it will subscribe the £2 necessary to have its own link."

It was agreed, upon the motion of Mr. HARVEY, seconded by the PRESIDENT, that the donation be forwarded.

A letter, dated 21st October (received on 2nd November) from a non-member, was read by the Secretary, who reported the action that he had taken in regard thereto. The Secretary's action was approved.

The SECRETARY reported that there had been a large amount of correspondence with the Clerk to the Devon County Council in respect of the Diseases of Animals Act. It was decided, at the last meeting of the W.C.V.M.A., to accept the fees offered, but to work for a better mileage rate, which had now been fixed at 6d.

Mr. GIBBINGS: Was a fee included for the examination of milk?

The PRESIDENT: Major Ascott and I discussed that matter, and we decided that we would not undertake that work but would adhere to the Ministry of Agriculture's decision and charge the County Council the actual cost of biological or microscopical examinations.

Mr. GIBBINGS asked if there had been provision made for fees for examining for tuberculosis in a herd of cows. If one were called to examine for tuberculosis in one or two animals it was presumed that every animal would be examined.

The PRESIDENT: A shilling for every cow.

Mr. GIBBINGS: Does that mean for every cow affected?

The PRESIDENT: No; a shilling for every cow in contact. If they had been much in contact in the fields I would examine all.

Mr. BOVETT: I have heard that is not accepted, because it would run into a big fee.

The PRESIDENT: In a report to the Chief Constable for Devon they have laid it down most emphatically that each animal has to be examined. I wish I had my papers here, but I have had that from Captain Vivian. The whole point is what exactly they mean by "in contact" animals.

Mr. GIBBINGS: The Act says "he shall examine all animals which he considers necessary." It is left to the discretion of the individual.

Mr. DUNSTAN: But it does not say "in contact."

The PRESIDENT: The Order says so distinctly, Mr. Dunstan.

Mr. BOVETT: Has your account been in long enough for any protest to be raised against it?

The PRESIDENT: No, but I am expecting it. I will bring all my papers to the next meeting; I am sorry I forgot to bring them here to-day.

The SECRETARY reported that he had attended a meeting of the Cornish veterinary surgeons in order to decide what should be done in regard to proposed fees. He reported the fees agreed upon.

The SECRETARY further reported that, in accordance with the decision arrived at the summer meeting of the W.C.V.M.A., he had visited Taunton with the object of drawing up a scale of charges for Somerset veterinary inspectors in conformity with Devon fees, and on Saturday last Mr. Saunders and Mr. Stevens met the Somerset County Council and agreed upon fees, all of which were a big advance on what they had before. It now remained to see whether Somerset men would accept the fees.

In the matter of Dorset fees, negotiations were still in progress with the idea of obtaining better figures, and he was glad to be able to say there was some hope of success.

The PRESIDENT observed that under the Tuberculosis Order it was presumed that at Market Inspections a surgeon should be at the market to keep a look-out for any animals coming in. That matter was not

discussed by the Devon County Council, although the police had piles of books on the subject. He would like to know how it affected the Totnes area.

Mr. DUNSTAN: Devon and Cornwall are excluded.

Mr. FERRIS: I have had nothing to do under the Tuberculosis Order. They have not asked me yet.

The PRESIDENT: At the last meeting in Torquay I mentioned the fact that when I went to Cambridge I was going to apply that the next meeting of the "National" be held in Devon. We had good support, but for political reasons it was decided to hold it in Dublin. I had a very nice letter from Professor Buxton which I will read to you.

THE PRESIDENTIAL ADDRESS.

The PRESIDENT: The Presidential Address was left over from our last meeting, and I think we will leave it over again. There is a great deal of detailed work to be got through this afternoon, gentlemen.

Mr. HARVEY thereupon proposed that the Presidential Address be published. Upon Mr. FRASER seconding, the proposal was carried unanimously.

The President's Address is as follows:—

Gentlemen,—I thank you for the honour you have done me by electing me your President for the present year. It is an honour which I fully appreciate, but one which I feel should have been conferred on one of the older and more seasoned members of the Association.

At the time you asked me, I did not feel myself competent to preside over you, but, as you insisted upon it, I decided that I would do my best to carry on the good work of my predecessors, all members of an Association which is very much alive, and I trust that, in spite of the fact that I am a young member, both in the number of years that I have been with you and in experience, with your help, we will have a very successful year.

On looking through the *Record* at the reports of other meetings, I find that our Association stands well to the front as to the number of members present at the meetings, and I hope that during my year of office we will have even larger meetings than heretofore.

I am satisfied that these meetings are to our mutual benefit, and I, for my part, never leave a meeting without having acquired some new knowledge.

I do not want to take up much of your time with an address, as we have several important matters to discuss, in addition to Mr. Penhale's paper, but I would like to say a few words on the following subject:

"THE VETERINARY SURGEON AND THE FARMER."

When I was an assistant in the North of Scotland, I was fortunate to be with a man who was a credit to his profession, in every sense of the word.

It was a poor district in which I worked. Sometimes the crops never ripened, and then the crofters were in a bad way, and I have heard it said more than once "that the crofters respected my principal more than they did the minister." No disrespect to the latter, for he was a good man, but more honour to the former.

My principal was a man of absolute integrity, with a kind heart, and he kept himself well abreast of the times, in spite of being one of the "old brigade." He was no respecter of persons, in the sense that, if the poor man's animal was bad, that animal got just as prompt and good attention as the animal of the wealthy distiller's, and often he did not charge for his services if he thought the man could not pay.

He frequently used to say to me: "Educate your clients and they will think the more of you," and I have proved this to be true over and over again.

My sojourn there was of great benefit to me, and all through my professional career I have tried to live up to his example, and also the high example set me by my late and respected principal, Mr. Bloye, of Plymouth.

Both these gentlemen set me a high ideal, which it has always been my endeavour to follow.

Coming back to the quotation: "Educate your clients and they will think the more of you": I do not want you to take this solely in the personal sense, but I feel that, if there was more co-operation between the farmers and ourselves, it would be to our mutual benefit.

In my position as lecturer at the Seale-Hayne Agricultural College in Veterinary Science, I come in contact, not only with would-be farmers, but with agricultural associations and individual farmers, and, furthermore, it is surprising how well meetings on veterinary subjects are attended by the farmers.

If I may say so, their ignorance on veterinary subjects is immense—such subjects (which I fear most of us think they know all about) as the causes of redwater, epizootic abortion and Johnë's disease—three of our worst scourges in South Devon, and I submit to you that it is for us to enlighten them on these matters. If you would only take the trouble to explain these things to the farmer, he would greatly appreciate your efforts, and when once he saw the sense of it, whether it be inoculation against epizootic abortion, intra-venous injection for redwater, or anything else that is new to him, he invariably makes up his mind to have it done, with beneficial results both to himself and the veterinary surgeon.

Devonshire farmers are slow to adopt anything new—even slower than my kith and kin across the border, but they *can* be converted, if we will only lay ourselves open to try and help them.

I am certain that the veterinary surgeon has a very important position to fill in this respect, but a position of which he does not avail himself, and I feel sure that he *can* fill it, if he will only try, when his efforts will reap mutual benefit, not only to the farmer and himself, but to the country at large.

Take, for example, "Grade A" Milk and Certified Milk. It took a good deal of hard work to get this movement started in my district, but eventually the Medical Officer of Health and myself persuaded one progressive farmer to start producing "Grade A" Milk.

The initial outlay in his case was fairly heavy as he was only a tenant farmer, and as his landlord would not do any alterations to the shippons, he had to carry them all out at his own expense—costing about £150. This project, however, was such a success that, after twelve months trading, he decided to try Certified Milk. The demand for his Certified Milk has now so increased that it equals the supply, and he is looking about to find some other local farmer who will also produce it for him, as he cannot add to his herd, on account of the size of his farm.

He reckons to pay off the initial cost in three years.

Many of you visited his farm at the summer meeting and saw for yourselves in what kind of shippons Certified Milk can be produced and I hope you will all go back to your clients and tell them that there is nothing out of the ordinary required to produce "clean milk," and that by doing so they will increase their profits.

In the case of the Seale-Hayne College "Grade A" herd, the number of applications there from surrounding towns for "Grade A" Milk is surprising, and the governors have also added to their herd and shippons to meet the demand. The veterinary surgeon can also do a great deal of good in his town practice to benefit the farmer, by advocating "Grade A" Milk amongst his clients.

I think I can safely say that the veterinary surgeon has more influence than anybody else with the farmers in advising them, and it should be his aim to avail himself of that opportunity on every conceivable opportunity.

In my experience, farmers do not like addreses by Ministry of Agriculture officals, and look on them with distrust. They think they are all "red tape," but they do listen, and listen attentively, and eagerly, to anything that veterinary advisers have to say.

At one time I use to think that it was a terrible thing for a veterinary surgeon to give a lecture to farmers, but now I think differently, for I am certain that, if a suitable subject is chosen, it is sure to benefit the profession.

The veterinary lecturer does not need to go into treatments, but may include biological treatments at his discretion, and he can make up quite an interesting and instructive paper by giving the history, symptoms and preventive treatment of the subject chosen. As I have said before, these lectures are greatly appreciated by the farmers, and do more than anything to show the farmers that the veterinary surgeons are not asleep, but are advancing with the times, and that if the farmers would only consult their veterinary advisers more, it would be to their advantage, and they would have no need for their usual stock of "cure alls."

In my position at the College I also get enquiries from farmers as to various diseases, and I usually manage to arrange my replies in such a way that it is of benefit to the local veterinary surgeon concerned, and occasionally get the farmer to leave a "quack," and employ a qualified man.

I do not want to keep you any longer, but I do want you to impress upon your clients the benefits that will accrue from producing "Grade A" and Certified Milk. You are the only people who can influence them, and you will find that it will also benefit you.

Report on General Professional Fees. — The SECRETARY: You have all had the list of professional fees sent around to you. I have received a few objections, but I expected more. There are several points to discuss, and I think the easiest way will be for us to pick out those items to which I have had no objections and put them to the meeting, and then take those to which exception has been taken.

The meeting then proceeded to go through the list *seriatim*, and agreed upon a minimum scale.

Mr. R. H. PENHALE then read a paper on "Parasitic Bronchitis in Cattle." This paper, together with the ensuing discussion, will be found elsewhere in this issue of the *Record*.

Mr. F. T. HARVEY then showed several kinds of wire saws for use in parturition cases: Gigli's saw, the ordinary surgeon's saw used for cutting bone, one made of Bowden wire and another of piano wire.

"With the aid of these saws, it is," said Mr. Harvey, "astonishing how well one can cut through the legs of a fœtus, and how quickly they will cut through bone. I am convinced that these instruments will save a great deal of hard work, and will be very useful in the future in parturition cases—they will certainly make them more pleasant than heretofore. I took off two legs of a calf the other day without any difficulty, and the cow was feeding a few minutes afterwards as if nothing had happened."

The members then took tea together, and the meeting closed with thanks to Mr. Penhale for his paper, and to the President for his conduct in the chair.

R. BARONS NELDER,
Hon. Secretary.

Scottish Metropolitan Division.*

ANNUAL MEETING.

The Annual Meeting of the above Division was held in the Royal (Dick) Veterinary College, Edinburgh, on the 14th October, 1925, under the Presidency of Principal Bradley. There were present the following members: Messrs. A. L. Robertson, Arbroath; J. Taylor, Edinburgh; W. Bannatyne, Haddington; J. Aitken, Dalkeith; W. Wallace Peggie, Biggar; Professors Mitchell, Linton and Greig; Messrs. A. Gofton, E. J. H. Sewell, and S. Robson, of Edinburgh; J. G. Ross, Linlithgow, and Wm. C. Miller, acting as Secretary in the absence of Mr. J. Howard Jones.

The following visitors attended the meeting: Mr. J. Brown, Perth; Major R. F. Stirling; Messrs. D. Lloyd Jones; D. S. Rabagliati; W. J. B. Robson; G. D. W. Davidson and H. Preston, Edinburgh; H. F. Downie, Falkirk; H. Begg, Hamilton; Dr. Barker, and Captain Mulligan, of Kenya Colony; while a large number of Final Year students availed themselves of the invitation which had been extended to them.

A meeting of Council preceded the General Meeting, at which recommendations were made regarding the election of office-bearers for the ensuing session.

The Minutes of the last meeting were taken as read, having been printed in the *Veterinary Record*.

In the absence of Mr. J. Howard Jones, the acting Secretary read a circular letter received from the Secretary of the N.V.M.A., giving the resolution passed at Cambridge concerning the scale of fees in connection with the Tuberculosis Order, 1925, which was drawn up by a Special Committee of Congress. Copies of the 'Minimum Scale of Fees' recommended by the N.V.M.A. to be paid by Local Authorities to Veterinary Inspectors under the Order, were circulated among the members present at the meeting.

Nominations.—The following nominations to membership were received: Mr. D. S. Rabagliati and Mr. H. F. Downie, proposed by Professor Linton; Mr. J.

*Received on November 5th.

Motion, proposed by the Secretary; and Messrs. H. C. Watson and J. P. Cook, proposed by Professor Greig.

ELECTION OF OFFICERS.

The Acting Secretary read the recommendations of the Council as to the office-bearers for 1925-26, as follows:—

President.—Mr. T. M. Inglis, or, failing him, Principal Bradley.

Vice-Presidents.—Messrs. J. Aitken, W. Wallace Peggie, and J. Taylor.

Secretary-Treasurers.—Messrs. J. Howard Jones and Wm. C. Miller jointly.

Auditors.—Messrs. S. Robson and J. Taylor.

Members of Council.—Messrs. A. Gofton, S. Robson, W. Bannatyne and Professor Linton.

Representatives to Council of N. V.M. A.—The President and Mr. W. Wallace Peggie.

Mr. GOFTON proposed, since he understood that it would not be convenient for Mr. T. M. Inglis to accept office, that Principal Bradley be re-elected as President for the ensuing year. This was unanimously agreed upon. The other office-bearers, as recommended by the Council, were duly elected.

Victoria Veterinary Benevolent Fund.—It was proposed by Mr. GOFTON and seconded by Mr. PEGGIE, that a subscription to the Victoria Veterinary Benevolent Fund of £2 2s. be sent from the Division. This was unanimously carried. Mr. Gofton further urged individual members to give their tangible support to those who were responsible for the administration of this Fund, so that they might be able to carry on their work with greater encouragement. He received a sympathetic response.

N. V.M. A. Presidential Chain. — Mr. GOFTON briefly explained the proposal that each of the Divisions of the National Association should be given an opportunity to contribute towards the provision of a link in the Chain to be worn upon official occasions by the President of the N.V.M.A. He indicated that it was a means whereby the various Divivions would be bound more closely to the parent Association, since each Division would have its name stamped upon the link to which it contributed, and he formally moved that this Division grant a sum of £2 towards the purchase of such a link. Professor GREIG seconded, and the motion was carried.

The President then introduced Mr. W. WOODS, of Wigan, to the meeting, and indicated the indebtedness of the Division to Mr. Woods for having come so far to speak upon "Reflections upon the 1925 Tuberculosis Order." [Mr. Woods' paper and the discussion thereon received publication last week.]

After discussion, the PRESIDENT mentioned that the comparative lack of animated discussion was due to the excellent common sense of the paper submitted, and not by any means to lack of interest or appreciation, and he asked those present to accord to Mr. Woods their very hearty thanks for his kindness in having given them such an interesting, instructive and exhaustive paper. This was accorded with enthusiasm, and Mr. Woods made brief acknowledgement.

Mr. PEGGIE proposed a hearty vote of thanks to the President for having conducted the meeting in so efficient a manner. This was carried and, after Principal BRADLEY had expressed his thanks, the meeting terminated.

WM. C. MILLER,
Joint Hon. Secretary.

Lancashire Division.*

A General Meeting of this Division was held at the Exchange Station Hotel, Liverpool, on Tuesday, October 20th, 1925, with the President, Mr. J. T. Allen, in the Chair. Other members present were:—Messrs. J. Holroyd, W. Woods, J. Hall, J. T. Eaton Jones, F. G. Edwards, P. T. Lindsay, E. H. Curbishley, H. L. Torrance, E. F. Wood, W. L. Cockburn, L. A. Watson, F. A. Ball, H. C. Hewetson, H. T. Matthews, C. T. Trevers, G. Mayall, A. B. Mattinson, W. Walker, Hy. Sumner, junr., J. N. J. Hagan, E. L. Butters, J. W. Procter, N. Woolley, J. H. Lomas, Warwick Fowle, K. D. Downham, F. S. Warburton, A. W. Noel Pillers, J. Spruell, and Dr. T. Hare.

Visitors were: Messrs. G. V. Slinn, H. M. Duff, J. Mackintosh, G. Durrant, A. Alexander, J. T. Quinton, and Miss I. L. Roberts.

The PRESIDENT, before beginning the business part of the meeting, stated that a serious outbreak of foot-and-mouth disease had occurred in the district of Hazel Grove, Stockport, and the restrictions which had been imposed applied to parts of Lancashire, Staffordshire, Cheshire, Derbyshire, the West Riding of Yorkshire, Manchester, Salford, Oldham, Glossop, Buxton, Stalybridge, etc. He also understood that there were further outbreaks which had not up-to-date been confirmed. He thought that they had really finished with foot-and-mouth in that district, but it did not seem to be so; it behoved them, therefore, to keep their eyes open, and to do the best they could to ensure that the disease was restricted as much as possible.

Payment of Subscriptions.—The TREASURER said that he desired to state that he had been authorised to collect subscriptions from members who wished to subscribe to the Garnett Memorial Fund. In addition to donations which had been made to the Secretary of the Fund, he had collected £11 13s. 6d. and that amount had been sent direct to the Royal College of Veterinary Surgeons. The members of the Division had contributed altogether £55 6s.

Visitors.—The TREASURER stated that there were several visitors present, some of whom were veterinary surgeons, some veterinary students. Mr. J. T. Quinton, Chief Inspector of Food and Drugs for the City of Liverpool, had also asked if he might be present. He proposed that the visitors be allowed to stay. Mr. SPRUELL seconded, and the proposition was carried unanimously. The President remarked that they were very pleased to have the visitors with them.

* Received on December 1st.

The *minutes* of the previous meeting were read and adopted on the proposition of Mr. MAYALL, seconded by Mr. CURBISHLEY.

Correspondence.—The Secretary announced that apologies for unavoidable absence had been received from: Messrs. Hy. Sumner, J. H. Carter, Percy Abson, C. Tracey, J. F. Dixon, J. McKinna, J. Abson, G. C. Lancaster, E. J. Burndred, R. Hughes, and Lieut.-Col. J. W. Brittlebank.

Elections.—Mr. G. Ellis, M.R.C.V.S., was elected a member of the Division.

The Secretary read a letter from the National Veterinary Medical Association *re* Veterinary Inspector's Fees under the Tuberculosis Order.

The President called on Mr. H. T. Matthews to open a discussion on the Milk and Dairies (Consolidation) Act, 1915, and the Tuberculosis Order of 1925. [A full report of this discussion appeared last week).

JOHN SPRUELL,
Hon. Secretary.

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

INTERNATIONAL VETERINARY CONGRESS.

Dr. L. de Blieck, Professor of Contagious and Parasitic Diseases of the Institute of Contagious and Parasitic Diseases at the Veterinary School, and President of the Faculty of Veterinary Medicine, University of Utrecht, has been appointed Secretary of the Permanent Committee of the International Veterinary Congress. This gentleman is well known to a great number of the profession in Great Britain and Ireland and his appointment will, no doubt, be received with great satisfaction by veterinarians in all countries.

Dr. de Blieck is master of several Continental languages, including English. He is at the head of one of the most up-to-date and best equipped veterinary schools in the world. It is of interest to note that, in addition to being a distinguished veterinarian, Dr. de Blieck has a fine bass-baritone voice and has sung at concerts and festivals at Leeds and elsewhere in this country.

FOOT-AND-MOUTH DISEASE.

"The Minister of Agriculture has decided that the precise locality in which an outbreak of foot-and-mouth disease has been confirmed shall be notified in future.

"Great Britain has now joined an international veterinary bureau, with headquarters in Paris, to discuss means whereby the disease may be stamped out in Continental countries whence it comes to these islands.

"The Minister estimates the loss per head of cattle affected by the disease at £5. On this basis the estimated total loss in France in 1919-20 was approaching £5,000,000."—*Evening News.*

* * * *

"The High Commissioner for Australia has received telegraphed advice from the Commonwealth Government that it has been decided to modify the embargo on the importation into Australia of cattle, sheep, swine, and goats from the United Kingdom, so as to permit the importation of Scottish pedigree stock provided the animals concerned are shipped from Scotland to Australia by a vessel which does not call *en route* at an English port.

"The declaration and certificates required by the Comonwealth Quarantine Regulations will, of course, be required in respect of any animals shipped by virtue of this concession."—*The Times.*

"The Scottish Board of Health have issued to local authorities a circular regarding the mode and regulations for veterinary inspectors in connection with the Milk and Dairies Act. The question of the appointment of a veterinary inspector as a sanitary inspector has, it is pointed out, been raised in some areas. Where the public health administration is under the general control of the Medical Officer of Health, there appears to be no objection to the appointment of the veterinary inspector as a sanitary inspector. As, however, the Board understand that such an appointment would be made principally to extend the scope of the veterinary inspector's powers in carrying out his own duties, it would be advisable in cases where the Medical Officer of Health is not in general control to arrange that the veterinary inspector should make any reports on sanitary matters, either to the local authority or to the Medical Officer of Health."—*Glasgow Herald.*

FRANK GARNETT MEMORIAL FUND.

EIGHTEENTH LIST OF SUBSCRIPTIONS.

	£	s.	d.
Amount brought forward from seventeenth list	419	6	6
Major R. Catmur	1	1	0
Midland Counties V.M.A., per W. E. Ison	1	1	0
R. C. and W. Trigger	1	1	0
Major G. Rees-Mogg	1	1	0
Royal Counties' V.M.A.	5	5	0
	428	15	6

Donations should be made payable to the Frank Garnett Memorial Fund, and sent to the Hon. Secretary, 10 Red Lion Square, London, W.C. 1.

R.C.V.S.—OBITUARY.

BRIGGS, Harry, 29 Annesley Road, Hucknall. Graduated N. Edinburgh, 22nd May, 1897. Died 8th December, 1925.

SARJEANT, JOHN WILLIAM HILYER DARLOW, 2 West Cliff, Eastbourne. Graduated Edinburgh, 19th December, 1902. Died 13th December, 1925.

ARMY HORSES IN INDIA.

The system of numbering the horses in India on a general roll is being abolished and in future the horses will be given unit numbers and be branded with them. A continuous and detailed record of the history of each animal will be kept from the day of purchase to the end of service, and the veterinary record kept in the units will give full details of all ailments and treatment.

CORRESPONDENCE.

Humanitarian Societies and the Veterinary Profession.

To The Editor of The Veterinary Record.

Sir,—A great deal is often said about the advancement of education and the progress of science, not only in the press but also on the platform, professional and lay. But this is certainly not appreciated by a section of the public, including a very large number who should by social surroundings and superior education, act or think better. In general, however, such persons do not seem to possess a very high degree of intelligence.

To some extent, members of our own profession are tainted with this lack of superior intelligence when they lend their names or assistance to humanitarian institutions that employ unqualified persons to treat or advise on the diseases or injuries of dumb animals belonging to those who cannot afford to pay the usual fees of the qualified veterinary practitioner. What would be said of a medical man who acted in a similar manner at an institution for the treatment fo human diseases or accidents, where unqualified service was rendered ?

Most, probably all, of these societies have no veterinary committee to assist in the deliberations of those who run or control them. Why is this ? Is it because reputable members of our profession would control the function of those laymen who run the show ? Or is it that no respectable veterinary surgeon would act under the present constitution of the committee of such institutions ?

But why is there the necessity for the springing up of these hospitals for poor people's animals ? Once upon a time, the free clinic of the Royal Veterinary College, and of the Brown Animal Sanitary Institution (London University), Wandsworth Road, S.W., catered for animals necessary to enable a certain class of poor persons to obtain their living.

The charitably disposed would show much more wisdom if they banded themselves together to obtain funds for the building and maintenance of a free clinic and hospital at the Royal Veterinary College, where the animals of poor persons would be treated humanely and skilfully for their diseases or injuries by a staff of highly competent veterinary surgeons, always on the spot.

It seems lamentable that, at the end of the first quarter of the 20th century, when education is extended to its utmost and science has progressed prodigiously, more humbug or quackery is demanded than in the days before compulsory education was introduced.

That to every advantage there is a corresponding disadvantage, seems to be a natural law. " If ignorance is bliss, 'tis folly to be wise." The poor dumb animal pays the price of unskilled treatment.—Henry Gray.

London, S.W. 5.

December 12*th*, 1925.

The Rebuilding of the Royal Veterinary College.

To The Editor of The Veterinary Record.

Sir,—With reference to Mr. Henry Gray's letter in the *Veterinary Record* of the 12 inst., may I suggest that the reason why the charitably disposed section of the public do not subscribe to the maintenance of the Royal Veterinary College is that the public only vaguely know of its existence or whereabouts.

If the college is to be rebuilt and the funds are available, why should not " the powers that be " approach one of the Universities, either Oxford or Cambridge, and do their utmost to have the Royal Veterinary College taken under the wing of one of them. The profession would then automatically be brought before the eye of the public and excite the sympathy and interest of the right class of people.

Surely this is the essential stepping stone in raising the status of the veterinary profession and in making it a career attractive to the best type of boy.

To prefer " to reign in Hell than serve in Heaven " would be a cruelly selfish and shortsighted policy and it cannot be expected that the parents of boys from our best schools will send their sons to a college which can offer no social advantages and where, at present, a very poor career is offered them.

The best type of boy for any profession is most assuredly the public school boy, nearly all of whom are the sons of well-to-do, educated people, some of whom, as time goes on, leave money, or other property to the college where they were educated professionally.

May I now be so straightforward as to suggest that at present most well-to-do, educated gentlemen would be somewhat indignant if the veterinary profession was suggested as a suitable career for their sons. This is, I believe, entirely due to the fact that the Royal Veterinary College is not properly known and not recognised socially, and they think that, by entering it, their sons would be removed more or less from the social sphere of life from which they come.

There are so many veterinary public appointments cropping up now-a-days, both at home and abroad, that it would seem a pity that they could not be filled by men of equal social standing to other first-class officials.

The traditions and associations with a University such as Oxford or Cambridge leave an improved stamp on a man which is always recognised and parents who can afford it are not going to let a boy miss that part of his education and chances of life-long friendship with desirable and influential people.

If a medical man can obtain his Degree at Oxford or Cambridge, why should not a veterinary surgeon do the same ? All veterinary students might not be able to afford a 'varsity career, and the same can be said of medical students, but surely, even now, there are sufficient veterinary students who could and would be only too glad of the opportunity.

I think that most of us would give our mite to see the R.V.C. forming a real part of one of the two best known universities of the world.—Yours truly, W. E. Phipps.

Oxford.

December 14*th*, 1925.

Valuation—Tuberculosis Order, 1925.

To The Editor of The Veterinary Record.

Sir,—In the special number of the *Veterinary Record*, more than one speaker was reported to state that if the suspected bovine animal exceeded a certain value, a valuer was called in, and the owner was debited with one-half of the valuer's fee. Is that ruling in accordance with the Order ? A case came under my observation where the owner asked £17 as the value of a cow in milk I considered was suffering from tuberculous emaciation. I informed the owner that I would call in a valuer, and enquired if there was any objection to Mr. ———. The owner replied in the negative. The valuer valued the cow at £8. The cow was, on *post-mortem* examination, certified as a case of advanced tuberculosis, which entitled the owner to 45s. for compensation. The Local Authority decided to deduct the one-half of the valuer's fee. The owner demurred, and has maintained that as he accepted the valuer proposed by the representative of the Local Authority —not by the Minister—no deduction is permissible.

The Order (Section 9, Sub-Section 2) reads as follows : . . . . . " After deducting from such sum one-half of their reasonable costs of any valuation of the animal by a valuer appointed by the Minister."—Yours, etc., J. Pollard.

Halifax.

December 12*th*, 1925.

National Veterinary Medical Association of Great Britain and Ireland.

EDITORIAL OFFICE : 10 Cray's Inn Square, London W.C.1.

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